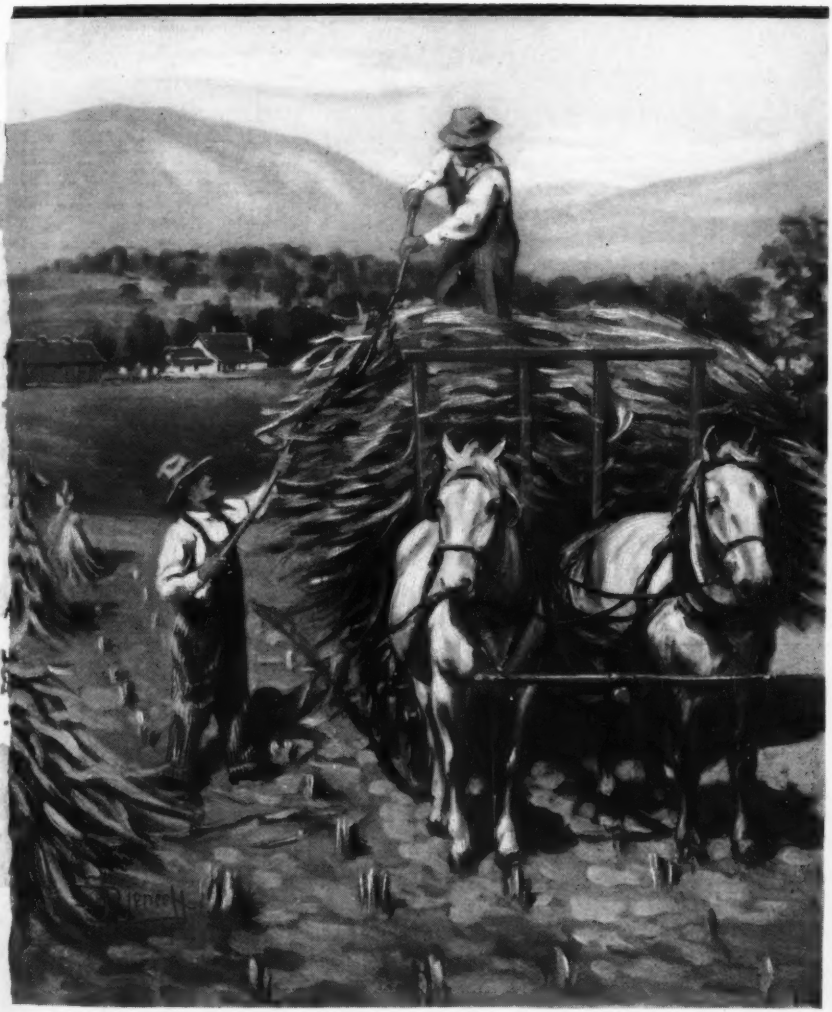
Better Crops

The Pocket Book of Agriculture.

October 1926 10 Cents



ules—Potash or Manure?—A Bushel per Hill—Around the
ear with an Apple King—Reforestation Day—Massachusetts

Striking the most profitable balance

THE big question which Florida citrus growers are asking today is not "Shall I fertilize?" but "How much can I use to strike the most profitable balance?"

Your profits depend upon the quality and yield of your fruit—and the fruit reflects the fertilizer.

Now is the time to make preparation for your fall fertilizing so that your trees may go through the winter months in the best possible condition.

Naturally the methods you follow will depend to some extent on your local conditions. It will pay you, however, to keep in mind the following facts:

A good supply of potash in your fertilizer is of great importance. It will help to give a thinner rind on your fruit and lessen the amount of rag. It has a marked benefit on the keeping and carrying qualities of citrus fruits and plays a very important part in maturing new growth and hardening the wood. Trees well supplied with potash are better able to resist serious damage from cold and insect attacks.

Experience has shown that for best results fall fertilizers for citrus trees should contain *less* ammonia and *more* potash than the spring fertilizers.

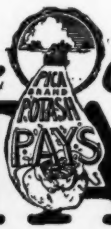
For trees producing 10 boxes of fruit, a sound and approved method is to apply during the year from 30 to 50 lbs. of fertilizer per tree. This same proportion may be kept for each additional 10 boxes of fruit. A well-balanced fall fertilizer for bearing trees will generally contain about 3% ammonia, 8% phosphoric acid and 8% to 10% potash. Applied in the right amount this should help you to strike a profitable balance.

Potash Importing Corporation of America,
10 Bridge Street, New York.

Potash gives best results when used in connection with a sound soil fertility plan. It is our purpose to discuss it from this viewpoint in accord with the fertility programs of the various agricultural extension forces.

Genuine German

POTASH



Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

VOLUME VII NUMBER TWO

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The Little Gray Home in the West

Better Crops

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¶ *Jeff in venturesome mood breaks a few*

RULES

By

Jeff McDermid

IT SEEMS to me as I read the biographies of men that the most successful were those who broke the most rules.

In fact, I can go further and state the proposition: To be a success you *must* violate the rules of your guide book, break out into new and unexplored territory and discover for yourself whether certain man-made rules are all that they are cracked up to be.

Rules are not laws and a rule-breaker is not a law-breaker. Rules are merely guide-strings set down the course to prevent human whippets from taking short cuts!

Laws are statutes, the breaking of which makes a man traitor to his brother, but rules are merely concentrated instruction, which may be accepted or rejected at will. When a rule is laid down by one in power it becomes a law and may not be violated without risk.

FOR CENTURIES sprinters have been taught the proper crouch on the starting line—body on the nervous *qui vive,* weight forward on the fingers, one toe dug in for a fulcrum to the catapulting body.

Then Nurmi!

A rule breaker who questions everything, accepts nothing until a personal trial has proved its excellence. Nurmi is a runner, I guess so! And a student of his

art! He found that running required an expenditure of nervous energy and that one had only so much of it. "If a share of the energy is dissipated in the nervous crouching which the rules call for I'll try standing up or some other stunt," mused Nurmi.

And he did! His peculiar style of running suits his build and temperament. He wins. Other runners have tried it and say it is no good. But it *is* good—for Nurmi—and that is what counts.

The trouble with rules is that they do not take into consideration the variations in men. They forget that what is one man's T-bone steak is another's arsenic.

Nurmi made his own rules and hence takes his proper place in The City of the Great with others of the immortal band who have had the courage to question custom and violate age-old precepts.

NOT long ago I was invited by a friend to visit a public-speaking class which he attends. He is a Grade A, Size No. 1 Scout, who, because he tries, improves daily.

I went.

And I left the class and the teacher pawing the air as I occasionally do.

Here's the story: The teacher—I will grant him the mantle of obscurity by naming no names, because, after all, he is a Good Fellow and a Good Fellow, be it known, is one who does the best he can with what he has—opened the evening by reading off certain rules which he explained must be followed if one were to become a good Public Speaker.

With great adroitness, the result evidently of assiduous following of his own system, he demonstrated after the reading of each rule just how the thing was done. Here, for example, was the way to throw the weight of the body forward on the right foot while scraping the left one up to a balancing posture, unnoticeably and without annoying one's audience.

"Then," he continued, "in making a gesture the wrist must precede the back of the hand—so, and the second and third fingers of the hand should cling together, with the little finger gracefully arched."

The class listened spellbound—future orators in embryo—hanging enthralled on the professor's every word.

Next, the teacher called for attention and announced that the regular five minute trials of the individuals in the class would commence, calling out the name of the first, together with this one's chosen subject.

For a full hour I nervously watched nervous men nervously crawl to the rostrum, address in a faltering manner "Mr. Chairman," and turn whitened faces to a challenging audience of classmates. So obvious were their automaton-fashion gestures that to this day I cannot remember one word of what any man said!

If the unfortunate near-orators were nervous, I was a flushed and hectic neurasthenic. I became more flushed and embarrassed as time went ceaselessly on. All the speakers moved with precision in cut-and-dried style, gesturing inanely alike, reminding me only of the wooden soldiers in the Chauve Souris parade.

Through it all the teacher sat with a benign and pleased expression, for all the world like mamma when little Helen says her piece at Sunday School.

When one five-minute man forgot his lines I began to perspire, and when the last man was through I was a wilted rag, and felt like nothing would give me

(*Turn to page 62*)

An Arctic Cross

By Ted Butlar

ALASKA dairymen may some day find themselves owning herds of cows having some of the hardiness of the Galloway, and at the same time, some of the heavy milk producing qualities of the Holstein.

Some time ago the Station had 23 of these crossbred animals of various ages. It is reported that all are polled, black, but smooth coated. It has been found that in stormy weather the crossbred animals face the storm and go along with the Galloways, while the Holsteins hunt for shelter.

Seven of the crossbred cows were producing milk during the calendar year of 1924. On a ration not much more than sufficient for maintenance, two of the cross-bred cows gave 5,383 pounds and 5,316 pounds of milk. These are considered very good yields as compared to the production of purebred animals under the same conditions. The butterfat tests average 3.07 for Holsteins, 3.8 for crossbreds, and 5.27 for Galloways.

At the Kodiak Experiment station, experimenters have found that Galloway cattle can survive the winters of southeastern Alaska with a minimum of feeding. This led, in 1916, to the starting of an experiment in crossing Galloways and Holsteins to develop a type of animal suited to the region. According to officials the crosses obtained appear to be hardier than the Holsteins and intermediate between the parents in milk production and in fat content of the milk.

In this connection it might be mentioned that the Holstein has found its way to the other climatic extreme—India and Indo-China—where several Holstein bulls are being used on the humped species to develop a milking crossbred.

Potash was applied here at the rate of 200 lbs. per A. Neither barley nor corn would grow here before potash was applied

POTASH or

By A. A. Burger

Cedar Falls, Iowa

"PROFESSOR," said my friend Mr. Northey of Waterloo, "what is the matter with this land? There you can see there is nothing and right here the corn is very good." He was speaking to a soils expert who was with him on a tour of investigation.

"A change in soil type" said the Professor.

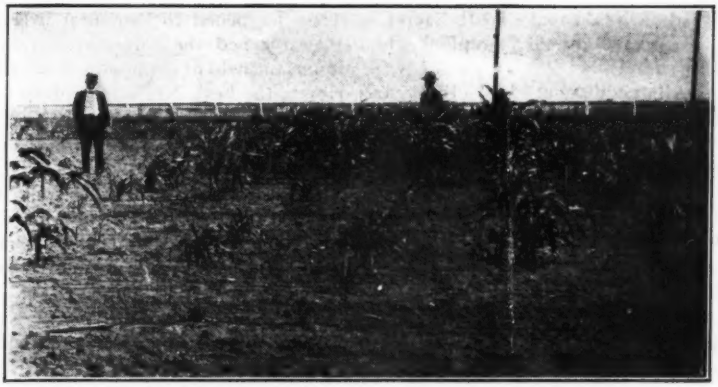
"So you think the soil is different here?" inquired Northey.

"Yes it must be or there wouldn't be any difference in the crop."

Mr. Northey was very innocent about this. His ignorance was simply profound. Yet in his unsuspecting professedly innocent way he was leading the Professor into a trap. No one would have suspected, in talking with him, that one of his delightful little tricks was to get all the information that he could, then, if possible, to get his visitor to the point where he could not explain his way out. County agents, in the course of their work often meet men of this kind.

They meet every day men who want the best information that they can get. Others, they meet, who know it all. But the "smart aleck" who discredits everybody else is perhaps entitled to the "berries."

Mr. Northey was not in this class. He was amusingly tricky, but withal broadminded, genial, and one of the most profound students of practical farm problems that I have ever met.



Mr. Northey (left) is standing in corn—or rather lack of corn—where no potash was applied. Potash was applied to the six rows at the right

MANURE?

¶ Read about a farmer who kept a Professor guessing

"No," said Northey, "if you should have asked a twelve-year old farm boy what made this difference, he would have immediately replied 'manure.' Well, manure would have made somewhat the same difference here, but this time it wasn't manure. Potash, at the rate of 200 pounds per acre produced this result. This is peat soil and manure would help it but potash produces more marked results and does it cheaper."

Farther up the road he led the way to some fertilizer experiments. It was on a level bottom, on fluffy, black, peat soil. "Here we put on 125 pounds of acid phosphate (16 per cent P_2O_5). You can see that there are no results. On the next strip we put on land plaster or gypsum. There is a slight improvement. Here, where the corn shows up so much better we put on a complete fertilizer. The next strip with potash and acid phosphate is the best, though the strip adjoining with potash alone is almost as good. In every case where there was plenty of potash the results are good."

OVER on the other side of the paved highway he led the Professor to a 40-acre field of oats on a pure peat soil. "A few years ago," said Northey, "this would not raise oats—it all went down. There was no strength in the straw and not the right kind of plant food in the soil to fill out the heads. We put potash on here and raised 65 bushels of corn per acre the first year while before it would not raise corn at all. We got a splendid second crop and then we followed this with oats.

What will this make to the acre?"

"Seventy bushels," replied the Professor.

"All right; get into this car and we will visit a mile up the road, the Sunny Slope farm, with soil of the Waukesha and Waukesha sandy loam types." Here they met Wm. Padget, the manager.

"Have you ever used potash here?" asked the Professor.

"I should say we have," replied Padget, "several cars. Notice that splendid field of corn? Last year it made 65 bushels per acre. It was treated with 125 pounds of potash and the increase in the corn was fully 15 bushels per acre. I think that we should have used 250 pounds of potash. Next year we will sow on some more and will put the field in barley."

"When we first started to use potash," said Northey, "the renters refused to sow it, but now they know that it pays them well and they are very anxious to use it and pay their half of the expense. I think that we have used 15 or 20 car loads since we started with it in 1903.

"NOW I'll take you to the Wapsie farm and you can talk to Mr. Firestone, the tenant there. There is an even 600 acres of Bremer loam, O'Neill sand, and Waukesha silt loam in the place and the farm is making us money every year. On this farm we raise hogs, feed steers,—feed everything grown on the farm and in addition to the manure produced we use 200 pounds of potash per acre."

On the way up Mr. Northey asked the Professor if clover would do well on a very sour soil. "No," he replied, "our experience indicates that it will not." They happened to stop first, when they reached the farm, at a very luxuriant field of mammoth and red clover, the best, Northey explained, that he had ever grown.

The Professor was strong on making the soil test for acidity. So as soon as possible he pulled out the test tubes and began making tests on the soil in the clover field. The solution in the tubes showed up just as red as wine.

"I thought you said that clover wouldn't do well on a strongly acid soil," Northey told him.

"I don't understand this," the Professor replied. "This is not the usual result."

"Maybe not,' replied Northey, "but you must remember that this field has been heavily manured and that some potash has been used on it."

Then he came back at him "strong as horse radish." "You cannot learn farming by keeping your legs under a desk. I think that every college professor who deals with the practical problems of the farm should get out on the farms and in touch with things that are happening. You cannot fool the county agent very long, he soon learns these tricks, he gets the real facts ground into him." That was the hardest swat that he gave the Professor that day.

Through a field of timothy that was five feet tall and as thick as it could grow they passed to a field of barley mixed with a little oats. It would soon be ready to cut, 45 acres that would make at least 50 bushels per acre. All of it had been treated with potash. While it would never grow barley before, this crop was standing up perfectly straight, straws long, heads long and well filled. It was a beautiful sight. And right by the side of the barley was a field of

(*Turn to page 55*)

Before *and* After

By *Professor* T. H. McHatton

Georgia State College of Agriculture

TREES get sick just like anything else, and when they do, they need a doctor. This was realized by a planter in the city of Washington, Georgia: he not only had one tree sick, but a whole orchard of about 80 acres of pecans. They were all sick.

This orchard was planted in the common Cecil clay loam of the Piedmont section and had attained an age of 18 years without producing profitable crops. The nuts fell off early and the trees were making a poor growth. Before cutting down the orchard, the owner decided to call in expert advice and see if anything could be done.

The Extension Pomologist of the Georgia State College of Agriculture went down to look the matter over. After consultation, an agreement was reached whereby the owner would turn over to the Pomologist the control of 20 acres of the orchard for 10 years in order to see what might be done to bring the trees into profitable production. As the varieties were mixed in the planting, the problem of pollination did not enter into the question: it seemed to be mainly a matter of nutrition.

In the fall of 1923, the orchard was introduced to its first cover crop; rye was sown, approximately a bushel to the acre. The crop of nuts on 20 acres that year was 446 pounds. During the winter all of the manure afforded by the plantation was taken to the orchard and spread about the trees. There was enough to put one and a half two-horse wagon loads about one-third of the plants. These same trees received two two-horse wagon loads of pine straw in addition to the manure as a mulch. All of the trees on the 20 acres had 20 pounds each of a commercial fertilizer carrying 8 per cent acid phosphate, 4 per cent potassium and 4 per cent nitrogen.

The rye was pastured and then turned under early in 1924, the orchard being planted to soy beans

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Effects *of* Limestone

By Dr. Robert Stewart

Dean, College of Agriculture, University of Nevada

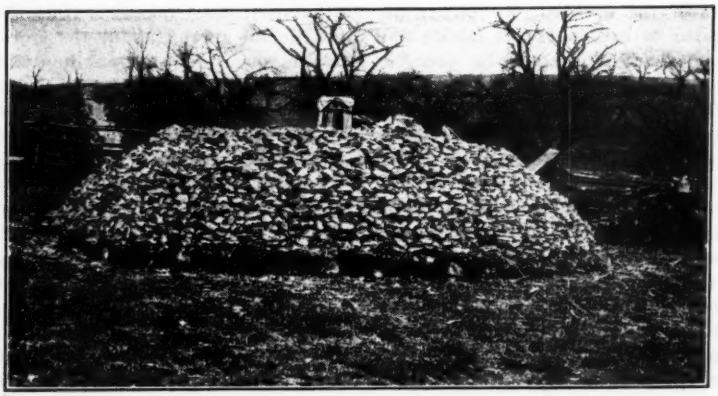
A LIMESTONE country is a rich country is an age old truth. Soils everywhere which have become famous for their persistent fertility are limestone soils.

Notable examples of this truth may be found in the blue grass regions of Tennessee and Kentucky, the irrigated regions of the far western United States, and the famous black soils of Russia and India.

Unfortunately, limestone, so essential to soil fertility, is quite readily lost from the soil in drainage water. In any system of permanent soil fertility which may be proposed, it is of fundamental importance, therefore, to add limestone materials to those soils in which they are deficient. The addition of limestone to the soil may be regarded as the first principle of soil fertility and should receive first consideration on the part of the progressive farmer.

There is an abundance of information to show that finely ground limestone is a convenient, economical and desirable form of limestone material to use for the correction of soil acidity. It represents the natural material always found in most fertile soils. There is no possibility of any injurious effects, such as the undesirable destruction of organic matter, or partial sterilization of the soil.

There are two kinds of limestone materials for use on acid soils such as high-calcium and dolomitic limestone and there is



Construction of stack for home production of burnt lime

on Crop Production

¶ Dr. Stewart is a well known authority on soil fertility

little choice between them, although, with other things being equal, preference would naturally be given to dolomitic limestone which is not so readily lost from the soil, is fully as effective in neutralizing soil acidity and besides furnishes another element of plant food, magnesium, to the crop.

The results obtained from experimental fields of the University of Illinois offer a wealth of material for studying the great benefit derived from the use of finely ground limestone for crop production. On these fields an application of four tons of limestone per acre as an initial application with a further continued application of two tons every four years has been adopted as a standard application.

The results obtained for the use of limestone are in addition to the results which are obtained from the best use of barnyard manure which could be obtained by the farmer from the manure which could be produced on his farm by feeding all the crops grown to livestock.

The effect of limestone on production of crops as shown by the increase produced by the limestone over results obtained by the use of manure are summarized in tabular form below for convenience of study:

Effect of applying ground limestone on growth of red clover

Increase in Yields Produced by Limestone

Experimental Field	Bushels Corn	Oats	Tons Wheat	Clover Hay	Soybean Hay
Aledo	4.5	3.9	0	.47	.04
Carlinville	7.3	4.3	7.2	.81	.24
Carthage	2.1	4.3	2.4	.13	.09
Enfield	13.3	5.4	7.0	..	..
Ewing	13.7	7.3	9.3	.68	.37
Oblong	7.8	8.5	1.5	.49	.26

These results emphasize the great importance of the use of limestone for the production of such common farm crops as corn, oats, wheat and clover.

From the data presented here together with some data from other fields the value of one ton of limestone may be calculated in terms of the crop produced. In this manner the efficiency of a ton of limestone has been calculated and the results recorded below as increased yields of various crops produced by one ton of finely ground limestone:

Value of One Ton of Limestone in Terms of Increased Crop

Field	Bushels Corn	Oats	Tons Wheat	Clover Hay	Soybean Hay
Ewing	16.9	12.2	11.0	.73	.40
Enfield	15.4	5.3	5.8	..	..
Oblong	5.1	6.9	2.6	.36	.19
Davenport Plots	8.4	6.5	13.0	1.39	.13
Hartsburg	6.3	3.1	.71	..	.04
Odin	8.9	18.5	13.00	.45	..

These results are extremely significant and are confirmed by an abundance of similar data from other fields widely distributed throughout Illinois and may therefore be regarded as very trustworthy results regarding the effect of applied limestone on the production of such staple crops as corn, oats, and wheat on acid soils.

On the Ewing field, for example, a ton of limestone has actually produced an increased yield of 16.9 bushels of corn or 12.2 bushels of oats, or 11. bushels of wheat, or 1460 pounds of clover hay or 800 pounds of soybean hay. The money profit obtained from the use of limestone on such soil with such yields of course will be determined by the price received for corn and the price paid out for the limestone.

It is, therefore, always desirable to remember the age old adage that "A limestone country is a rich country." If limestone is not native to the soil of any given region it will always be found exceedingly profitable to add it to the soil in the finely ground condition in any type of farming. Limestone, of course, cannot be substituted for other necessary soil treatment but it has a definite part to play in the maintenance of soil fertility and will materially reinforce the effect of other treatment.

The question naturally arises regarding the form or kind of limestone to use. There are two forms of limestone available for the use of the farmer, high-calcium and dolomitic limestone. There is little choice between the two forms. Dolomitic limestone adds both calcium and magnesium to the soil and this may be an actual advantage in some soils similar to the soils of Southern Illinois. Dolomitic limestone has slightly greater

(*Turn to page* 50)

A Bushel per Hill

This hill yielded 72 lbs. potatoes

By Arnold Z. Smith

County Agent, Everett, Washington

"TWO or three years ago, or it might have been even longer than that, I raised a big hill of potatoes and exhibited it at our fair. It was a good sized hill and made a large looking pile of potatoes. People that saw the amount of potatoes did not believe that they could all come from one hill and they plainly told me so, so I decided that at some time I would repeat the thing and, if possible, prove it to them that such a thing is entirely possible."

Thus spoke Mr. Adolph Heck, gardener, business man, farmer and so forth, of Snohomish county, Washington, to the county agent who had called in response to a telephone message from Mr. Heck.

"Now what I want you to do is to go out with me to my little farm and help me dig this hill of potatoes so that you may know and that I may have proof of the fact that such a hill can be raised. The one I now have may be larger or it may be smaller than the other, but we will dig it and find out."

Mr. Heck explained that the other hill he had raised had produced 37 pounds of potatoes. Many people doubted the fact that so many potatoes could be raised in one hill. In fact they told him that the potatoes he had exhibited had come from different hills.

A party was organized to dig Mr. Heck's big hill of potatoes. In the party was Mr. Heck, a

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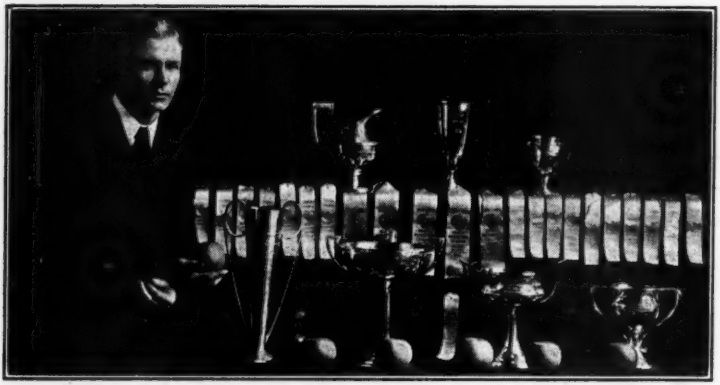


The proof of the apple is in the eating. Here are a few of the ribbons and cups Webster has won with his famous apples

AROUND *the* YEAR

By Dr. Guy A. Peterson

Madison, Wisconsin

ON the rocky slope of the range of hills along the Mississippi river, at La Crescent, Minnesota, a picturesque 50-acre horticultural farm catches the first rays of the morning sun. In the beautiful home at the foot of the bluff lives D. C. Webster, "Apple King of the Mid-West" and monarch of the afore-mentioned side hill ranch that is today earning him a net income in dollars of a thousand a month, and a much more valuable income in the form of a worth while job that keeps him happy as well as busy while the sheckels roll in.

Two county agents had advised us to call on this genial lover of red apple cheeks and get him to relate the interesting story of his phenomenal rise in the fruit world of Minnesota. We found him to be a most interesting personality, albeit he was a man of few words, and had a particular aversion for talking about himself. Perhaps that is why newspaper men a few years ago called him "that mysterious stranger from the North" when he succeeded in capturing five out of ten of the championship prizes in the mid-west apple show at Council Bluffs, Iowa. His home is now decorated with dozens of cups and trophies that have been won by his beautiful, luscious fruit.

Webster's earliest recollections

Raising apples isn't all play. Webster always cultivates the young orchard with an extension disk harrow that gets in under the trees

with an APPLE KING

¶ This man succeeded because he loved his job

are associated with the kindly Minnesota bluffs, for he used to help his grandfather, J. S. Harris, who was the pioneer apple grower in that section. Webster's own father, a well driller by trade, lived across the Mississippi in the Gateway city of La Crosse, Wisconsin. He had little love for apple growing, but young Webster inherited his interest in fruit from his maternal grandfather on whose bluff farm he spent his summers, weeding onions at 50 cents a day.

AS he grew older he forgot the orchards for a time and became a railway mail clerk on a run between Minneapolis and Chicago. However, as the fast mail train sped by his beloved hillside playgrounds, the thought kept occurring to him, that he could make a success with apples if he applied brains and modern methods to the task. In 1902 he bought his first strip of bluff land—land that no one thought was worth much—and started to grow fruit. His mail clerk job took him away from home six successive days but left him the alternate six days for work on his ranch. He "deadheaded" it between La Crescent and Minneapolis before and after each run until about eight years ago when the income from the orchard became so much more important than his salary as a mail clerk that he quit the road job altogether.

HE now works eight or nine months of the year on his ranch

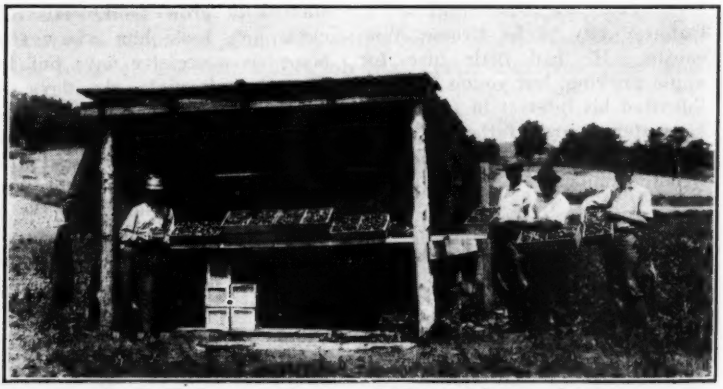
and spends the other four months traveling, exhibiting at the big horticultural shows, studying horticulture, and enjoying the beautiful home which his orchard has built. To him no scenes in America can compare in beauty and in charm with the scenic views that he and his family get from his own home.

As time went on he increased his holdings and plantings until now he owns 50 acres of valuable orchard land, more than 25 acres of which are in bearing. Others have followed his successful example until the Minnesota bluffs have become dotted with orchards, making a picture not unlike that along the German Rhine. If the apple market warrants, there will be many more orchards before many years go past. Webster's persistence is shown by his record in the state apple orchard acre contest. A marathon race is as nothing compared to such a contest because the prizes are not given until eight years after the trees are planted. Only nine of the original 28 contestants remained in the contest until its close, but Webster's plot was awarded the blue ribbon honors and a prize of $200.

Webster begins his horticultural year about the middle of March, at which time the pruning days are celebrated. It takes him and his two assistants about 30 days to complete this work. Each tree is pruned every year. The apple king can give no definite rules for pruning, as he is a man of action rather than words, but he says that every tree must be sized up as an individual problem. He never lets a tree grow out of reach, but he cautions against the practice of too heavy pruning at any one time, as this might upset the balance.

THE semi-dormant spray is the next thing on the program. He applies this at the time the buds begin to swell, the exact date depending upon the season. For this spray he uses a mixture of one part lime sulphur to about nine parts water and a five pound package of arsenate of lead for each 200-gallon tank of the solution. His engine driven spray apparatus carries a pressure of 300 pounds to the square inch, making it possible for him to get every twig and branch covered. It throws 11 gallons of spray a minute. His grandfather before him used an old squirt gun, with so little pressure

(*Turn to page* 47)



D. C. Webster and some of his strawberry pickers

¶ A practical farmer's profit-making ideas

Food for Better Crops

By T. S. Nored

Paris, Tennessee

THE average person knows that man desires a change of diet, commonly speaking gets tired of the same kind of food day after day. But the average person does not know that a change of diet, or in other words, a complete diet, is necessary for the best interests of mind and body.

A child may continue to live on bread and meat alone for a period of time, in fact may reach the age of maturity, but would not be the perfectly developed man or woman, physically and mentally, of a person that had been reared on a properly balanced diet. Foods containing proteins, starches, sugars, vitamines, etc., are necessary for the full development of mind and body.

If a complete food diet is necessary for the human family, why should it not be necessary for the perfect development of plant life? A complete fertilizer is none other than a complete properly balanced food for plant life. Nitrogen to produce the leaf or foliage, phosphate and potash to develop the fruit. One without the other will not produce the maximum yield.

I have in mind a friend that told me he could not grow strawberries. He had at different times and with different varieties tried and always failed. He grew rank vines but no berries. I suggested the plant food in his soil was not properly balanced. He owned a suburban home and kept a horse and cow. All stable fertilizer was put on this plot of land. The trouble was as I expected, an oversupply of nitrogen and a deficiency in potash and phosphates. When these were supplied, he had no further trouble.

IN the tobacco belt of west Tennessee, a freshly cleared field will produce a tobacco large and fine in appearance, but it will be inferior in quality, light bodied and light weight, bringing a lower price at a sale than the heavier bodied tobacco grown in older lands, all because the phosphate and potash are not in proportion to the nitrogen of these new lands.

Often you will see an unusually promising field of wheat, rich dark green, rank in growth, talked of as the best crop in the vicinity. But, as the bloom falls, the mesh forms, you find only one or two small, inferior grains to each. Probably it falls or beds down, blasted along with the owner's hopes.

Why this failure? Because the

plant food, the necessary element to produce the grain to mature and develop the crop, was lacking. You laid the foundation for a crop, but you failed to build on your foundation and lost.

If you are a farmer your success, prosperity, and happiness, as well as of those dependent on you, depend on your crop yield.

Nitrogen produces and hastens the growth of plant and foliage. The rank wheat indicated a sufficient amount of nitrogen, and as phosphate and potash are necessary to produce the fruit or grain, is it not plain evidence when the crop failed to make the maximum yield, that the essential elements were insufficient to produce the yield that would have made the crop a paying proposition instead of a loss?

Personally I have used and experimented with almost all kinds of commercial fertilizer, from 14 per cent acid phosphate to nitrates and potash of different kinds, complete fertilizers of low and high grades, on various types of soil, used check plots and weighed and measured results.

TO sum it all up, the safest general rule is to use the highest grade fertilizer you can procure. Some think the cost per bag is too great. But it is not the cost per bag, but the cost per pound of actual plant food for which you are paying, and the profit from the use of same that makes for economy or waste. Why pay the freight and expense of handling and lose the time of applying two bags to get the same amount of plant food there is in one bag of high grade that costs only a little more per bag?

The foundation of successful farming is the largest possible yield at least expense from every acre cultivated. To be a successful farmer, you must study to improve and enrich the soil by proper crop rotation, plowing under legumes, and putting into the soil the elements lost by leaching, washing, and cropping.

In the fall of 1922 I purchased a piece of land then in grass, on which the owner told me he had worked his head off trying to grow corn and other crops. He finally gave it up and sowed it to grass. In 1923 I cut a very light crop of hay from this land. The next spring I broke and thoroughly prepared this land for a crop. The result left no big profit, but as I was laying the foundation for a land building campaign, I was satisfied with results.

LAST spring, I put the available farmyard fertilizer on this land and thoroughly prepared it for corn, put at the rate of 200 lbs. 8-4-6 fertilizer to the acre, and disked it into the soil, planted the corn, cultivated level, and at the last cultivation drilled cow peas in the middles, using at the rate of 100 lbs. fertilizer per acre under them. As soon as mature I cut and shocked the corn, and a few days later I plowed the peas under and ran a heavy drag over the land. The 23rd of September, I double cut crossways with a disc, sowed rye and vetch at the rate of 1 bushel rye and ten of vetch to the acre and disked lengthwise, followed with crimson clover at the rate of 10 lbs. per acre, both it and the vetch being inoculated. I had a perfect stand of all, and a heavy crop to plow under the next spring.

I finished husking and weighing the corn. The rate of yield was 55 bushels per acre.

(*Turn to page 42*)

SMUT is Controlled in Cheyenne County

This happy youngster is holding smutty heads from untreated seed in his right hand in comparison with one head from treated seed in his left hand

By E. Bruce Brunson

County Agent, Cheyenne County, Kansas

LAST fall D. R. Porter, Extension Plant Pathologist from the Kansas State Agricultural College at Manhattan, and the county agent showed George Boyd how to treat wheat seed for smut. The copper carbonate dust or dry method was used. One load of seed wheat was treated at the rate of about four ounces of dust per bushel.

When Mr. Boyd planted this seed on some corn stalk ground on September 25th, he marked the plot where the treated seed was planted. Then for demonstration purposes he planted a few drill rows of untreated seed in the same plot, planting the untreated and the treated seed on the same morning.

This summer, just before Mr. Boyd was ready to cut, a visit was made to this plot. In the untreated plot 104 heads of smutted wheat per thousand were found, while in the treated plot only one head per thousand was found.

The county agent's 5-year-old boy was so tickled over the results that he held the 104 smutty heads in one hand the one head in the other while his picture was taken.

Fertilizers Speak Up

By H. E. McCartney

Fairmount, Indiana

¶ *Farm trials taught this farmer how to use fertilizer*

LLOYD NICKELS of Fayette county, Indiana, set out in 1923 to secure a remedy for low yields and poor quality of wheat which had prevailed on his farm for years. The farm occupied by this man was located in a section once rich in fertility.

In early years, crop yields had always been splendid. As time passed the fertility had become depleted and the yields grew less and less. Along with the decreased yields, there was a deterioration in the quality of the wheat and oats which he produced.

Nickels says that it was through work with the county Farm Bureau that he became interested in commercial fertilizers. It happened that he was elected president of that organization and served in that office for two years. Being of a thoroughgoing type he endeavored as best he could to promote the work of the Farm Bureau and to take a prominent part in carrying out the projects and policies which were deemed of benefit to the members in the county. Accordingly he visited many township meetings each month in company with County Agent M. F. Detrick.

One of the problems that frequently came up for consideration was the depletion of soil fertility and the possible remedies. Nickels began to think of commercial fertilizers in connection with his own farm and to wonder if they would not help him to overcome the conditions that caused his yields to be low and the quality poor. Previously he had used no fertilizers and knew little or nothing with regard to their application.

He talked with Detrick who agreed with him but who suggested a trial demonstration rather than the adoption of some plan that had not previously been tried in the county. Both men, being engaged in public work, were anxious that any worth while results that could be secured would be of use to other farmers of the county.

After numerous conferences as they returned home at midnight from the township meetings or as they walked over the fields on Nickel's farm, these two men, the Farm Bureau president and the county agent, worked out a plan calculated to give commercial fertilizers an opportunity to prove their merit in restoring fertility and improving the quality of the wheat.

THE wheat field was divided into five equal parts for the seeding in the fall of 1923. Care was exer-

The fertilizer was applied with the drill when the wheat was sown in the fall

cised to see that each division was similar to the other in soil and slope, in natural fertility and in previous management. This was done to be sure that there would be no undue advantage in favor of any fertilizer mixture that might be applied. On all portions the soil was of a character described as fine silty loam.

The first section of the field was left unfertilized. At harvest time the yield was in accord with the previous crops produced upon the farm. The yield was 18.8 bushels per acre and the quality was rather inferior just as Nickels had come to expect.

Next to the section left unfertilized he put on acid phosphate at the rate of 220 pounds of the 20 per cent brand per acre. At harvest time this yielded him at the rate of 22.9 bushels. Here was an increase of 4.1 bushels per acre as a result of the use of this application of acid phosphate which had cost him $2.30 which amounted to 56 cents per bushel. The crop sold for approximately three times that amount. This made a nice profit from the use of acid phosphate. Not only that but it seemed to Nickels that some of the added fertility was left in the soil for succeeding crops.

On the third section an application of 220 pounds of acid phosphate was made in just the same manner as with the preceding except that 32 pounds of sulphate of ammonia were added. This brought the yield up to 23.5 bushels. The increase in yield due to the addition of the nitrogen compound was but six-tenths of a bushel. This additional fertilizer had cost him $1.09. Hence the increase did not repay him for the expense of its purchase.

On the fourth section of the field he began to try the use of potash. In carrying out the plan 220 pounds of acid phosphate were applied as before with the addition of 20 pounds of muriate of potash of which 20 pounds were used on each acre. This was a light application. Nickels will endeavor to

learn from further trials whether or not larger amounts can be applied with profit. The result of this trial was that the yield was boosted to 26.6 bushels of which 3.9 bushels can be credited directly to the use of the potash. Inasmuch as the expense for potash had been only 55 cents per acre, the resulting increase in yield of wheat cost was but 14 cents per bushel. Also there was a noticeable increase in the quality of the grain. According to the appearance of crops grown on the same land the succeeding year there was fertility left from the application of acid phosphate and potash which was helpful.

On the fifth section the three fertilizers were combined in the same amounts as before there being applied 220 pounds of acid phosphate, 32 of sulphate of ammonia and 20 pounds of potash. This combination brought a yield of 28 bushels. This was an increase of 9.2 over that secured from the unfertilized area. This would seem to speak well for the use of a complete fertilizer. The increase over the immediately preceding section where the application was the same except for the use of ammonia was 1.4 bushels and the cost of this increase was $1.09 or at the rate of 79 cents per bushel which meant a slight profit from the use of ammonia.

All these applications of fertilizer were made with the wheat drill at the time of seeding the wheat in the fall. Hence Nickels is of the opinion that the small amount of labor required to handle the fertilizer is not sufficient to justify making any charge for labor against the fertilizer.

THE year following the production of the wheat crop just described, a cross section of the field was left in meadow; a mixture of clover and timothy having been sown in the wheat crop in the spring of 1924. It was apparent to all who viewed this field in 1925 that the growth of clover and grass was very much less on the section upon which no fertilizer had been used. Because of the similarity of the soil on all parts of the field the lack of thrift on the one section could be credited only to the fact that no fertilizer had been used.

Nickels conducted a test with his corn also in 1924. In this he found that the application of 380 pounds of 20 per cent acid phosphate increased his yield 8½ bushels.

AGAIN in 1925 he continued his trials. This time he devoted his attention largely to his corn and the use of acid phosphate and potash and combining this with a lighter application of a complete fertilizer at planting time. Accordingly he applied with his wheat drill just before planting, 300 pounds of acid phosphate and 50 pounds of potash. Then, at planting time, he applied from the fertilizer boxes, which he had purchased for the purpose and placed on his planter, 125 pounds of 2-16-2 complete fertilizer. This was applied alike to the fertilized and unfertilized portions of his field. Hence the increase which he secured and which was 13.81 bushels is to be credited to the use of the acid phosphate and potash. This increase was made at a cost of 40.3 cents per bushel. Thus there was a very satisfactory profit in this without making any allowance for the fact that added fertility was left in the soil for succeeding crops in the rotation.

He made still another trial in which he used the 2-16-2 fertilizer on one portion of a field and left an adjoining portion without any application. In this he secured an

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¶ *No. 7 of Professor White's series*

Kentucky Blue Grass

By J. W. White

Soil Research Chemist, Pennsylvania State College

BEFORE taking up the discussion of pasture fertilization it is important to present data concerning the plant food removed from the soil by blue grass cropping and also to study the relative response of blue grass and cultivated crops in a grain rotation to application of nitrogen, phosphorus, and potash. Table 1 shows the plant food removed by blue grass on four differently treated plots (Computed on the basis of the average composition of blue grass hay).

The cause for pasture depletion where continuous cropping is practiced is shown in this table. Over twice as much nitrogen and potash and 66 per cent of the phosphorus applied are removed by cropping. Reference to a later paper will show, however, that nitrogen fixation is going on rapidly in the pasture soil at a rate sufficient to more than offset that lost in cropping. On an average, the three soils contain 46,600 pounds per acre of potash. A liberal portion of the potash removed in crops should, therefore, be obtained from that already present in the soil. The three soils contain, on an average 3,200 pounds per acre of phosphoric acid, largely present in an unavailable form. Only 1.4 per cent is soluble in fifth normal nitric acid. Soluble phosphorus should therefore be applied in liberal quantity, considerably in excess of that removed by the pasture grass.

A review of the paper dealing with the response of blue grass to mineral fertilizers brings out some interesting facts concerning the relative value of the three important fertilizer constituents. It is of great importance here to show the value of N, P, and K in the

TABLE 1. *Plant Food Removed in Pounds per Acre Annually by Kentucky Blue Grass Based on the Average Yields of the Three Soils*

Plot Treatment	Yields of Hay	Nitrogen Applied[1]	Nitrogen Removed	Phosphoric Acid Applied[1]	Phosphoric Acid Removed	Potash Applied[1]	Potash Removed
Ca	1149		15.3		6.2		24.1
CaP	2257		30.0	32.5	12.2		47.4
CaPK	2763		36.7	32.5	14.9	25	58.0
CaPKN	4000	24	53.2	32.5	21.6	25	84.0

[1] One-half biennial application.

TABLE 2. *Percentage of Increased Yields Attributed to P, K, and N in the Production of Kentucky Blue Grass and Crops in a Rotation System. Computed on the Basis of Average Yields on the Three Soils*

	Kentucky Blue Grass			Grain Rotation		
	P	K	N	P	K	N
Proportionate cost of treatment.....	21	16	63	21	16	63
Per cent increased yield—direct effect[1]..	27	15	58	53	43	4
Per cent increased yield residual effect[2]..	75	21	4	55	45	0

P = CaP — Ca, K = CaPK — CaP, N = CaPKN — CaPK.

[1] Year fertilizers were applied. [2] Second year residual effect.

production of Kentucky blue grass as compared to their importance in a grain rotation. Table 2 shows the difference in behavior of the three constituents under the two systems of cropping.

Tables 1 and 2 furnish valuable data as a guide for determining the most economical fertilizer treatment for meadows and pastures. It has been shown that there is a distinctive difference in the response of cultivated crops and those in permanent sod to applications of soluble nitrogen. Phosphoric acid and potash, however, show practically the same values in the two cropping systems. Table 2 shows that nitrogen applied in addition to PK has no economic value in the grain rotation. However, the year nitrogen was applied to the PK treatment on the pasture, it gave 58 per cent of the 100 per cent increased yields attributed to P, K, and N. During the years following the fertilizer applications, phosphoric acid becomes the dominant factor, causing 75 per cent of the total increased yields as compared to 21 per cent for potash and only 4 per cent for nitrogen. The CaPKN treatment gave yields 76 per cent in excess of PK the year applied, but only 2 per cent increase over PK the following year. It became evident that nitrogen applied as nitrate of soda has no residual effect and should, therefore, be applied annually. A study of the data indicates that better results would also be secured if the PK treatments were applied annually, using one-half the biennial application and including also this proportion for nitrogen.

The supply of nitrogen in the soil in excess of that artificially applied depends upon the rate of nitrogen fixation (azofication) and that lost by conversion of the organic nitrogen thus fixed to soluble nitrates (nitrification).

The fixation of atmospheric nitrogen depends upon the presence of liberal amounts of organic residues as a source of bacterial energy. The rate of fixation is controlled by soil aeration, that is, the supply of elemental oxygen. In order, therefore, to increase the supply of soil nitrogen it becomes necessary to so manage the soil that fixation goes on more rapidly than nitrification. Thus, in a grain rotation, from the time wheat is seeded in the fall until the hay sod is plowed for corn, a period of about 33 months elapses during which time nitrogen fixation goes on more rapidly than nitrification because the soil becomes more compact and reduces the excess of atmospheric oxygen.

The wheat secures its nitrates from that formed slowly after seeding together with the supply left from the oats ground. When the sod is plowed for corn this accumulated organic nitrogen, together with the sod residue, is converted into nitrates in sufficient

quantity to meet both the needs of the corn and the following oat crop. Unfortunately, from the time the land is plowed for corn until again seeded to wheat, nitrates are formed more rapidly than can be utilized (especially in the case of the corn crop), resulting in a loss of soluble nitrogen in the drainage water.

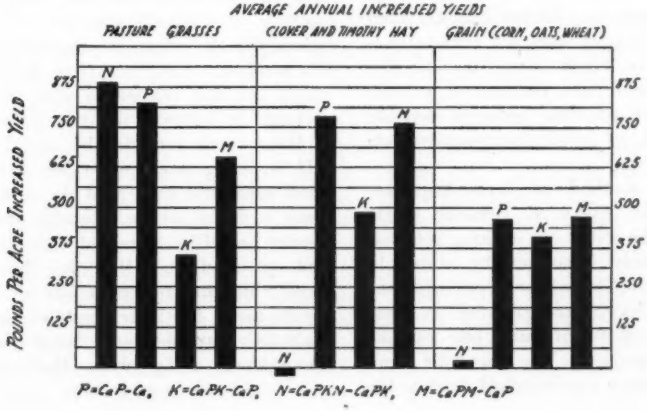
When the soil is well supplied with lime, phosphorus, and potash, there is little need for applications of mineral nitrogen. In fact, an excess of nitrates reduces nitrogen fixation. On an average of the three soils in crop rotation, 181 pounds of nitrogen were removed in crops on four acres where PK were used and only 185 pounds where 96 pounds of nitrate nitrogen were added in addition to the PK treatment. At the end of eight years at Snow Shoe, on the PK treated soil, a total of 726 pounds of nitrogen was fixed as compared to 400 pounds on the soil treated with PKN (not including that lost by leaching). Of the 181 pounds of nitrogen removed in crops on the PK plots, 52 pounds came from the clover and 129 pounds from azoto-bacter. Where PKN were applied 47 pounds came from clover, 96 pounds from applied nitrates, and only 42 from azoto-bacter (estimated).

Under permanent sod, nitrogen fixation goes on rapidly, while nitrification is limited due to the lack of sufficient oxygen. The rate of nitrification may be estimated by the nitrogen removed annually in crops where PK is applied, which amounts to an average of 37 pounds per year. At Snow Shoe the rate of fixation has been 135 pounds per year. Where PK treatment was applied on the three soils, 147 pounds of nitrogen were utilized by blue grass as compared to 213 pounds on the PKN plots (average of four acres).

From these figures it may be concluded that an annual addition of soluble nitrogen is necessary for the best development of blue grass in permanent sod, while on rotation crops, where the soil is plowed three times in four years, the reserve nitrogen accumulated during the 33 months of permanent sod and stubble is converted into nitrates in sufficient quantity to meet the needs of the grain crops.

COMPARATIVE RESPONSE OF FARM CROPS TO N, P, K AND MANURE TREATMENTS ON DEKALB, VOLUSIA AND WESTMORELAND SOILS

AVERAGE ANNUAL INCREASED YIELDS



Better Seed Potatoes

By Ford S. Prince

Extension Specialist, Soils and Crops, University of New Hampshire

¶ *Now is the time to start looking for them*

THE experience of farmers everywhere has been that potato seed will "run out." Just why this happens, unless care is taken to prevent it, is a matter that has been worked out during recent years.

"Running out" of seed potatoes is now known to be due to a series or group of degeneration diseases. Four of these have been isolated and named as mosaic, leaf roll, spindling tuber and giant hill. No doubt others will be found upon more thorough isolation and investigation by pathologists.

POTATO growers who would combat these degeneration troubles should choose one or the other of two methods. Either buy certified seed annually and get thereby potatoes in which these inherent diseases have been reduced to a minimum or practice some reasonable method of seed improvement on the farm.

The method of farm improvement in vogue at present starts with the tuber as a unit, selected preferably from healthy plants in the field. These tubers, cut into four seed pieces, are planted so that the progeny of each one can be kept separate. The four hills from each tuber are watched during the growing season and should any degeneration troubles appear in any one of the four hills are discarded.

The progeny from all tubers which have a clean bill of health is saved and stored separately for planting the second season. All the seed from one tuber is planted in a block or piece of row and again kept separate. Elimination of units which show the degeneration troubles is again made and again only the units which show no disease are saved. For the third year's planting all the progeny from the healthy tubers is thrown together and planted to produce seed for the main crop the following year.

The control of plant aphids with some contact spray and the prompt roguing of diseased plants is necessary for the complete success of this method. Isolation from fields which are not rogued is also important on account of the spread of these virus troubles by aphids.

It is easier perhaps to buy certified seed and better to do so in those sections where climatic and storage conditions are not safe for seed production. But in those areas which are recognized as good potato areas the latter method appeals to many men and forms the foundation, along with that of

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Howard M. Gore, Governor of West Virginia, planting the first tree in a state-wide reforestation project

Reforestation Day

By F. N. Darling
County Agent, Cabell County, West Virginia

IT was only a few years ago that West Virginia had an abundance of timber. Nobody seemed to care about the future as long as the supply lasted. Not until the State Forestry and Conservation Commission began making an intensive survey early this year only to find the forests almost gone, did the people realize the true situation.

Governor Howard M. Gore in opening the campaign for more forest trees said in part: "The whole forest situation is out of joint. It is necessary to readjust the conditions in such a way that each community may be able to more nearly meet its demands with its own supply instead of depending upon distant points. Each year we consume 200 cubic feet of wood for each man, woman, and child. Our consumption is four times the present rate of replacement by forestation. We must take immediate steps to solve our problem."

This call to arms was soon answered by communities all over the state. The Lumber and Supply Club of Huntington, enjoys the

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Massachusetts

By *Sidney* B. *Haskell*

Director, Mass. Agr. Exp. Sta., Amherst, Mass.

¶ *This is the sixth stop in our tour of experiment stations*

THE first effort at organized investigation in Massachusetts was the creation of the Massachusetts Experiment Station in 1878, made possible by a gift of $1,000 for one year by Levi Stockbridge.

It was hoped that the State would perpetuate the institution by the appropriation of additional and continuous sums, but not until 1882 was an act passed by the State Legislature establishing the Massachusetts State Agricultural Experiment Station with a yearly appropriation of $5,000 for its support. This was shortly increased to $10,000.

The station was located on the grounds of the Massachusetts Agricultural College, under the management of a Board of Control, with Dr. Charles A. Goessmann as its director. Its principal lines of work were animal feeding, forage crops, fertilizer and soil tests, orcharding and plant disease. In 1888, as a result of the Hatch act, the Hatch Experiment Station of the Massachusetts Agricultural College was established as a department of the college, with H. H. Goodell, president of the colleg, as director; the professors of the several departments of the college being members of its staff.

In 1894 the Masachusetts Station issued its final report, and was merged with the Hatch Station. This continued until 1907, when the name was changed to the Massachusetts Agricultural Experiment Station and Wm. P. Brooks made director. On July 1, 1920, Sidney B. Haskell became director. Between 1907 and Dr. Brooks' retirement, Dr. Joseph B. Lindsey was director for a brief period, and Professor F. W. Morse for two periods of a year or more each.

THE principal lines of work at present undergoing investigation relate to insect pests, fungous diseases of farm and garden crops, orchard problems, vegetable and cranberry production, bacteriology of the soil, studies in farm management, agricultural economics, chemical problems relating to the soil and to insecticides, animal nutrition, poultry breeding and management, tobacco production and tobacco cropping systems, and soil fertility studies.

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Better Crops' ART GALLERY *of the month*

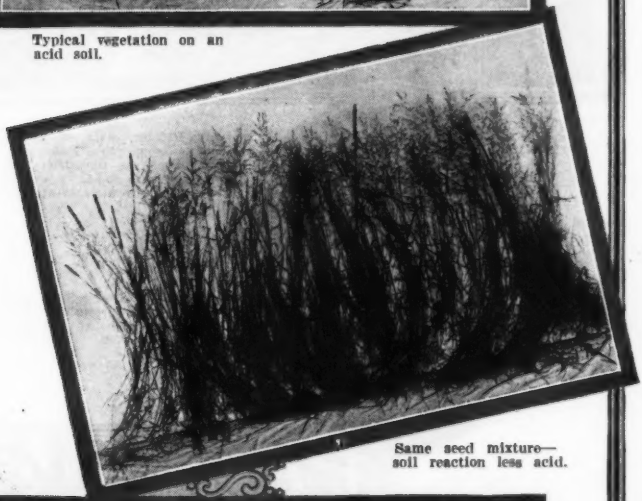
SIDNEY B. HASKELL

Director, Massachusetts Agricultural Experiment Station, Amherst, Mass., since 1920. Before taking the helm of this active force, he was General Director of the Soil Improvement Committee, National Fertilizer Association

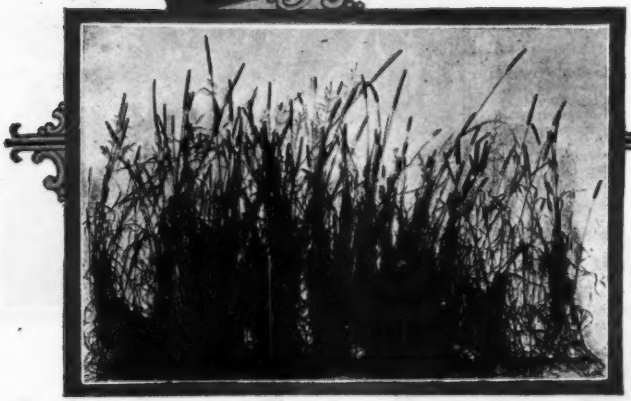
Dr. J. B. Lindsey, Vice Director and Head of the Department of Chemistry, Massachusetts Agricultural Experiment Station.

Dr. A. B. Beaumont, Professor and Head of the Department of Agronomy, Massachusetts Agricultural College and Experiment Station.

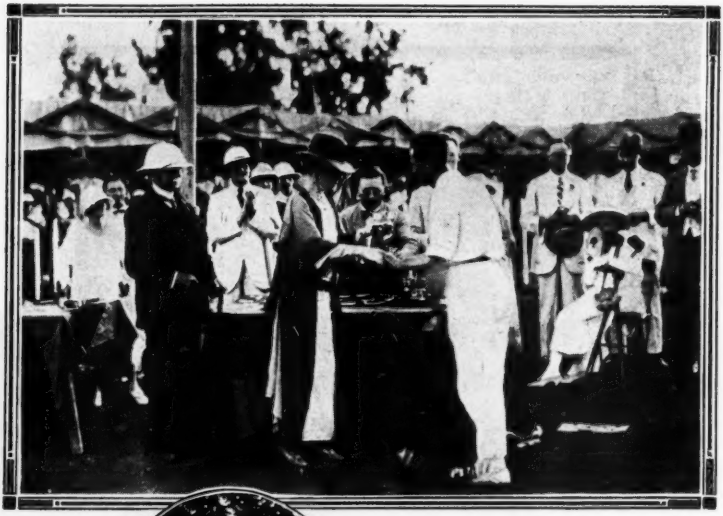
Typical vegetation on an acid soil.



Same seed mixture—soil reaction less acid.



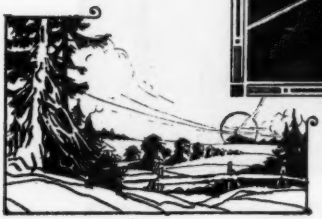
The same with lime added to bring the soil to neutrality—Massachusetts Agricultural Experiment Station.



Lady Plumer, wife of the British High Commissioner to Palestine, presenting silver cups to the Jewish colonists for the best farm exhibits at the first Near East Agricultural exhibit held in Palestine.

Two tall men standing with eight foot stalk of oats grown on the Exeter Co-operative Farm at Aylesbeare, Devon, England.

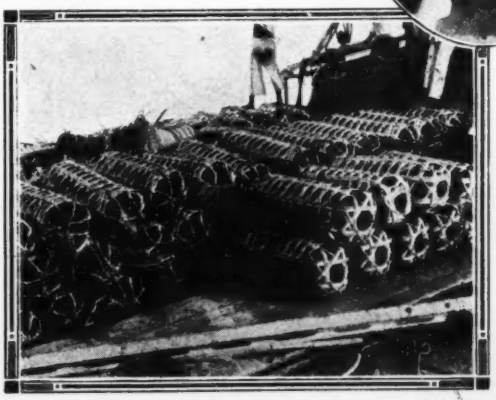
This little Dutch miss is very proud of her prize-winning horses at a recent agricultural fair held in Enschede, Holland.



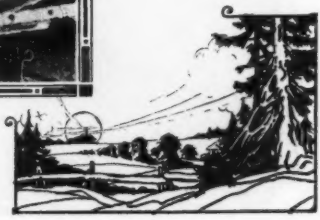
Farming in

Spain is evidently not all romance with its crooning guitars and beautiful dances. These Spanish gentlemen conduct a chicken market on the streets at Barcelona.

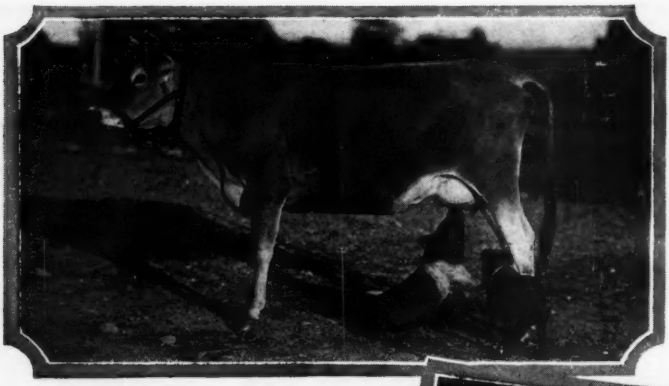
An old woman of Kerman, Persia, selling butter in front of her house. Butter is obtained from goat milk or the milk of black buffalo but very seldom from cattle.



For centuries the most approved method of transporting pigs in China has been to wrap them in wicker baskets and ship them to the buyer.



other Lands—



Another proof that cooperation solves the difficulty. These little pigs believe in working together.

". . . Grub de 'taters out de groun',
'Simmons soon be ripe an' soun',
Git you ready, 'possum houn'."
—May Byrn Crowe.

No hurry—why worry? seems to be the attitude of these two.

The Editors Talk

TRADING—business—is as old—as old as man.

One of the great tasks our modern civilization has set itself is to join the new to the old—science to business. What can scientific research do to make production—distribution—and consumption more efficient, more profitable, and less wasteful? There is no option about this. We are not doing it because we want to. We are doing it because we have to.

MODERN BUSINESS

There will be greater and far more reaching changes in industry and business in the next fifty years than there has been in the last five hundred. Think for a moment of abolishing the gold standard—yet Dr. James F. Norris in his presidential address at a recent meeting of the American Chemical Society, predicts that future discoveries of chemistry will do this.

According to Dr. Norris when science learns to use the new kind of energy tied up to the atom, it will cause an unparalleled revolution in the economic welfare of man. It will cause the economic system to base itself on units of value of a more fundamental type than gold represents.

"When the world learned how to use heat as a source of energy, a new epoch of civilization was marked out," he said. "When heat was the only form of usable energy to bring about transformation in matter a great chemistry was built up.

"With the mastery of electricity a second epoch in civilization was created and a new chemistry was born.

"We are now beginning to study the effects of a new kind of energy on matter—the energy tied up in the electron and the atom. We are beginning to learn how to obtain and use energy with a high intensity factor, and the result will be again a new chemistry and a new world to live in.

"As a result of a look ahead, I am filled with confidence in the future. I see in the next half century a great development in chemistry in the world, and especially in this country, where the conditions are most favorable. I see our knowledge of matter extended so broadly that what we know today is but the foreground of an impressive picture."

This merely indicates the extent to which future change may occur in industry and business. Change is going on now and must continue.

Scientific activity and economic pressures thus raise one great problem. How can science help industry? How can the scientific and the business man work together?

There will be much searching of heart and mind; the exchange of new points that are gulfs apart; friction and misunderstanding; out of which here and there will emerge something that looks like a solution to one of the many problems involved.

Whatever the problems, and they will continue to be difficult in the extreme, they cannot be solved by each group avoiding the other or discussing which is the more important. They can only be solved by a greater understanding.

Independence of either group is a fiction. It does not and cannot exist. Why not acknowledge the fact—which is an interdependence of the scientist and business man on each other?

Forget self—forget our group—see only the opportunity and what we can do to achieve it. Pull together for the credit of all—not ourselves alone. Only on this basis of the forgetfulness of self can any man accomplish anything in modern scientific business.

Or in the terms of ancient philosophy, would a man find himself in the coming era, he must first lose himself.

POTASH

As pointed out by the Department of Commerce in a recent publication on potash "the fertilization of the soil is not merely an agricultural requirement, but also a national necessity, if our present economic and commercial status is to be maintained."

The question must arise, do we know what we ought to know regarding the role of potassium in plant life? Our answer is decidedly—No. On the assumption that many soils contain potassium, the role of this element in plant nutritional problems has been neglected.

Experimental and research work are inadequate. More such work is needed.

As the population increases, the demand for more acres of arable land, a stable and more economical food supply will become more urgent. The demand for more fundamental and exact knowledge regarding potassium, both from the economic and scientific viewpoints, will continue to increase.

Shall we have looked far enough ahead and be able to answer the questions the future will demand?

This is a vital question for those whose duty it is to know anything regarding the functions of potash in crop production.

SINCE the dawn of civilization, the strength and world influence of nations has been determined by their ability to produce food enough for their population.

LAND BOOMS AND THE FARMER

Food products in excess of a nation's needs constitute a basis for commerce. The extent of commercial transactions in a large measure represent the actual wealth of a nation.

Aside from the actual wealth of a nation, we have what is termed potential wealth, meaning undeveloped resources. It is this feature of a nation's wealth that calls for careful application of the best minds of a nation to insure national development and financial security without undue exploitation of our resources.

All wealth is primarily dependent upon a successful agriculture. Without agricultural prosperity there is little hope for commercial prosperity.

It is true that our mines and forests have contributed immensely to our national wealth. Vast sums of money have been spent—great cities have been built—excellent transportation facilities have been provided, but could this have been accomplished if our farms had failed to provide food for the industrial workers?

Unfortunately industrial prosperity and agricultural prosperity have not kept abreast in the race. The farmer, though prosperous here and there—as a whole has been the first to feel the pinch in times of financial depression.

In that period during and following the World War there was a nation-wide land boom. Farms which had stood for 50 years or more at from $50 to $150 per acre suddenly shot to $300 and $400 an acre. This boom no doubt was the result of big profits on the strength of war prices. Farms changed hands many times. Speculators got busy and immense sums of money were made. Bankers loaned vast sums to farmers on long term mortgages.

Then came the slump. The war ended. Lower prices for grain and other farm products forced the farmer into a corner. With the high priced land and high prices for what he had to buy, the low prices for farm products made it impossible to pay

out. Thousands of farmers as a result lost all they had and the banks loaded with frozen mortgages in many instances became insolvent, to say nothing of the thousands of country merchants whose books were loaded with accounts of honest, hard-working farmers who could not pay.

The dilemma about the mid-western farmer and financial condition is sad. However, it is not unlike what obtains in Florida or other places where land booms have visited.

Looking at the whole situation from the viewpoint of an economist, it is perfectly obvious that the whole trouble is a case of overcapitalization. Farmers cannot possibly earn any return on this overload, and unless land values and existing market values can be equalized again, the problem appears impossible of solution.

Legislation may temporarily bring relief, but of vastly greater value in the matter of righting conditions, seems to be education. No better proof of the futility of legislation is found than in a survey of areas where thousands of farmers have owned their farms for years, did not take stock in the land boom, and continued farming at old land valuations without big mortgages. These farmers today are happy and prosperous and stand as a living memorial to the safe and sane policy of American agriculture.

Realizing fully the evils of the land boom on certain farming areas, the consequent effect on banking interests that have suffered, it appears highly appropriate at this time to recall that "it does not pay to cry over spilt milk."

The boom has done its work, the farmer and banker have suffered, the politician is apprehensive. But facts are facts and truth always comes out on top.

In the final analysis the important thing is to profit by our mistakes. Why not forget about our experience of the land boom era and substitute a real solution for the good of those who will follow us?

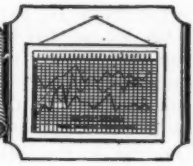
As stated what is needed more than legislation is education. Every school and college should study the farm problem from an economic standpoint and by teaching sound principles of farm values, farm finance, and better farming methods, can do much to prevent similar catastrophes in the future.

Last but of no less importance is the need for banking interests to have trained economists who know the farm situation.

With a better economic background for the farmer and the banker, our agriculture will be secure.

In short—Let's have an Educational Boom.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

Light for Hens

Hens as well as pullets may now stay up late on poultry farms if the advice of the New Jersey State College of Agriculture is taken by poultrymen. The specialist there says the experience of the station has shown that it pays to lengthen the day for the older birds as well as for the young ones. He also says that artificial light can be used to advantage in the fall as well as in the winter. Whatever system of lighting is used, it should be started when the number of daylight hours falls below 13.

Corn Binder to Fight Corn Borer

The State of Ohio has been putting on demonstrations of machinery designed to fight the European corn borer in the northern counties where this insect has been attacking the principal crop. Agricultural engineers at the University have designed low-cutting attachments which leave fewer borers in the part of the stalk left standing in the ground. The borers in the part of the stalk cut off are crushed in the husking process if machines are used. It is reported that some manufacturers are now shipping only low-cutting machines to the regions infested with the corn borer.

New Standards for Milk Products

Amended standards for milk products adopted by the Food Standards Committee and promulgated by the Secretary of Agriculture include a large number of classifications, an indication of the present complexity of the dairy industry. The list includes: milk, pasteurized milk, homogenized milk, skimmed milk, buttermilk, goat's milk, ewe's milk, evaporated milk, sweetened condensed milk, evaporated skimmed milk, sweetened condensed skimmed milk, dried milk, and dried skimmed milk.

Food Fallacies

A few food fallacies were mentioned in this column recently, and now we are tempted to report a few more mentioned at a recent conference at the University of New Hampshire. There Dr. George Foster pointed out that tomatoes do not thin the blood, that they are not in any way unhealthful. He said that no proof has ever been brought that cucumber skins are poisonous, nor that lobster and milk do not go well together. He said cherries and milk together are not dangerous, and that other fruit juices can be taken with milk, and that eggs cooked in water do not cause warts. Apparently it takes science and experience a long time to drive out superstitions about food, otherwise there would not be so much talk about it.

Hogging Down Corn Costly

Dr. C. W. Campbell of the Kansas State Agricultural College, has made a statement perhaps surprising to many farmers in the Middle West. He said hogging down corn in Kansas is generally a wasteful practice, an expensive way of feeding hogs. He said that in a year like this one it is bound to be bad practice. These statements

were based on experimental work. One lot of 105-lb. pigs were fed by the hogging down method and another lot was self-fed on corn in dry lot. Both lots were given one-fourth pound of tankage daily. During 40 days the hogging down lot consumed or wasted 488.5 pounds of corn and 17.7 pounds of tankage in producing 100 pounds of gain. The other lot was on feed 30 days and consumed or wasted 275.78 pounds of corn and 12.28 pounds of tankage per 100 pounds of gain produced. The pigs in the dry lot were kept on feed for another 30 days, when it was found that for every 100 pounds of gain made during the whole period they had used 371.06 pounds of corn and 13 pounds of tankage. Wet weather was responsible for some of the waste.

Combine Harvester

The use of the smaller combine harvesters in the West continues to receive attention. In Montana this fall they have been keeping careful records of 100 of these machines in the Judith Basin and other wheat regions. Engineers working on this problem have constructed a home-made drier which is designed to solve the wet grain problem. This apparatus, it is hoped, will economically dry the inmature or wet grain and green weed seeds. The Montana men believe that with this improvement the small combine harvester may replace the binder header and stationary thresher in many parts of the state.

Something New for Turkeys

The turkey has always refused to become thoroughly domesticated, spending a good part of his summer as a semi-wild bird, but in Minnesota they have forced him to submit to artificial methods. They did this by taking advantage of the helpless bird while still an egg. Instead of hatching them in the ordinary way under the hen and giving them the range of the farm and of the neighbor's farms, they have had them hatched in incubators, keeping the poults in brooder houses where feed and temperature can be carefully regulated. The young birds are also kept on clean soil away from grown-up turkeys and other poultry.

This modern practice has taken away much of the danger of loss from blackhead, which has made turkey raising in many places almost impossible.

Oiled Paper for Apples

A number of years ago the Department of Agriculture developed the use of oiled paper on boxed apples. Results were so satisfactory that this paper is now being used in a modified way for barreled apples. Instead of wrapping the apples in paper, shredded oiled paper is scattered through the pack. Reports are that when this packing is properly distributed apple scald is controlled very efficiently. In 19 tests there was 67 per cent of scalded apples in the untreated barrels, while in the barrels packed with shredded oiled paper there was only 4 per cent, and eight of the barrels were entirely free of the scald. The use of the paper adds 20 to 25 cents to the cost of packing, a cost well worth while when the fruit is held beyond the peak of the season.

Champion Hen No. 175

The Oklahoma college has a white Leghorn hen, with a number instead of a name, that laid 137 eggs in 137 consecutive days. Professor Thompson, head of the poultry department, says this is a record. The record for consecutive laying, it is said, was formerly held by Lady Jewel, a Leghorn hen at Woodland, Wash. This bird laid 132 eggs in that many days.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

A Letter From Africa

EDITOR'S NOTE:—*We are always pleased to hear from our readers and especially when the letters are chatty and give us a peep into the home life of our big "family." This letter, which just arrived from one of our readers in the "Dark" continent, throws so much light on conditions there that we want to pass it on to all of you.*

Umbogintwini
Natal, South Africa
31-7-26

Dear Sir:

Your little journal is reaching me regularly though each copy takes about two months to reach me. I find the news in BETTER CROPS interesting and unusually easy to read.

You may like to know that the first copy I received was in a package of literature sent me by Messrs. Armour's Fertilizer Sales office, Chicago.

I was pleasantly surprised to find my money order reproduced on page 54 of the December number, and no doubt the bilingual wording gave you cause for thought. This country labors under the strain of two official (and about a dozen unofficial though recognized native) languages. All government printed matter is issued in the official languages: English and "Afrikaans"—a form of patois Dutch.

You will pardon my adding that I was somewhat amused by your references to the "wild and woolly" nature of our country. Whilst you, no doubt, know that the Union of South Africa is on the average very much more advanced than are some of your south-western and perhaps mid-western states, yet many of your readers regard it, perhaps, as a barbarous, uncivilized country of blacks. The country is served by 12,000 miles of railroads, of which many hundreds of miles are electrified. The number of Rolls-Royces, Packards, Chryslers, Dodges, Buicks and ubiquitous Fords runs to six figures. We have six universities, many agricultural colleges, and a system of compulsory primary education. The goldmining industry runs into eight figures of dollars, and the diamond, coal, copper and other mining operations total almost as much annually. On the whole our agricultural and industrial progress is a matter for pride, as we have recently been privileged to demonstrate to a party of your countrymen who toured the Union.

Nevertheless until quite recently (4 years ago) a large troop of elephants caused very considerable damage to crops and property in the Addo district, within 50 miles of the city of Port Elizabeth, and a comparatively well populated area. Lions are still frequently

troublesome in the northern portions of the Union and Rhodesia, whilst rhino, hippo, crocodiles and buck of all descriptions abound in certain parts. Today, however, these serve rather as a sporting diversion to farmers, than as a menace to their comfort; even the "Black Mamba," the world's most deadly snake which is a subtropical African reptile, takes very little toll of human life.

The European population of the Union is about 2 million, and the native population some 7 million.

I am sending you, attached to this letter, a resume of the cotton-growing industry in this country, which incorporates an outline of the cultural methods generally adopted. I hope you will find it acceptable for publication in BETTER CROPS.

If any of the matter sent you, whether photos or M.S., is unsuitable please return them to me, debiting my subscription account with the postage, as local stamps are of no use to you.

By the way, please ask your subscription department to make a point of warning me in good time when renewal of my "dollar" is due. I do not wish to miss any copies of "B. C." on account of forgetfulness.

With good wishes for the progress of your Journal,

Yours very truly,

(Sgd.) H. E. ANDRIES.

* * *

Food for Better Crops

(*From page* 18)

Rent of land per acre.	$5.00	
Seed, peas and corn..	1.50	
Fertilizer 300 at 1.80..	5.40	
Work	17.20	
Total cost per acre...	29.10	
55 bushels at $1.00....		$55.00
Roughage estimated value		15.00
		$70.00

$70.00 less $29.10, leaves $40.90 profit.

After two years' attention, I intend to continue to increase the yields and profits on this piece of land, for I have only begun. What has been done, anyone can do.

You can soon fill your land with humus and nitrogen by the growing of legumes, then balance the plant food by supplying the necessary phosphates and potash. The richer your ground in nitrogenous elements, the more phosphates and potash are required to make the maximum yield, and this is where your profits come from, for the expense of preparation and cultivation is the same whether you make 10 bushels per acre or 100. Thorough preparation, cultivation, fertilization and rotation of crops carried out systematically, with cooperative selling methods conducted in a business way, will put agriculture on a plane with other business.

We are now living in an age of progressiveness, from ox cart to automobile, from Paul Revere's ride to deliver a message to flashing it over a wire or by radio almost instantly, and so on. Production and output in every line is the order of the day with every possible item of cost being cut out. Economical production — some farmers are masters of the problem (the successful ones) some are not (the failures). To which class do you belong?

Reforestation Day

(*From page 27*)

honor of being the first group in the state to sponsor a public tree planting. It was a big success. Practically every member of this organization together with a large group of Boy Scouts and members of the 4-H clubs from two counties spent a whole day on a hillside farm several miles out in the country setting out 4,500 young Norway spruce and Scotch pine. There were more than 100 workers in all. The mayor of the city was there the whole day, not only to make a speech but to plant trees. And to prove that Governor Gore believes in practicing what he preaches, he came also having to walk several miles up and down steep hillsides in order to reach the place.

Much credit for the success of this event is due T. W. Skuce, Extension Forester of the West Virginia University and W. L. Wilson, owner of the farm on which the trees were planted, who worked unceasingly in getting everything ready.

As a result of this special Reforestation Day, many other communities in different sections of the state are doing likewise. It is not too much to predict that young forests will be growing everywhere in the state within a few years.

* * *

Before and After

(*From page 9*)

that were cultivated. That fall the crop was 962 pounds of nuts from the trees; more than double that of the previous season. In the fall of 1924, rye was again sown and another third of the trees mulched with straw and manure. The rye was turned under in the late spring of 1925 and another inter-crop sown. The application of 20 pounds of commercial fertilizer per tree was repeated. Then a drought set in: the most serious drought this section of the country has known since 1840; practically no rain at all from June through September. The crop from the 20 acres this fall was around 600 pounds, and this was two-thirds of all the nuts produced on the 80-acre orchard.

The picture accompanying this article is noteworthy. The nuts are all of the same variety. No. 1 is the average in size of the nuts produced on the trees that have not yet been mulched with manure and straw, but have received all the other treatment. No. 2 is the average from the trees that were mulched and manured in the fall of 1924; they have been under mulch one year. No. 3 is the average nut from the trees that were mulched in the fall of 1923; they have had two years under mulch. This seems to be an excellent demonstration of what organic matter in the soil and under the trees will do for pecans.

This winter we will mulch the remaining third of the trees on the 20 acres and continue the proper methods of orchard management. About 1934, the Pomologist hopes to have something rather interesting to report; he has not announced a cure as yet, but he thinks his patients are rapidly convalescing. The owner has decided not to cut down the rest of his trees.

How Old Is the County Agent?

From *The Official Record*

ALTHOUGH agricultural extension work is generally considered a new thing, the idea of adult instruction in agriculture is at least 200 years old. C. R. Woodward, editor, New Jersey Extension Service, finds that a farm demonstrator was proposed for the colonial planters as early as 1723. This, with some interesting facts about the problems of farming in colonial days, is revealed by a study of the colonial documents in the New Jersey archives.

The proprietors and the British lords of trade were anxious to develop the culture of flax and hemp and the production of other naval stores. Ignorance of cultural methods on the part of the settlers, however, stood in the way. Demonstration farms, as they would be called now, to be operated by "community leaders" were proposed by Lewis Morris, president of the East Jersey Council, in a letter to the lords of trade, written from Perth Amboy, N. J., November 21, 1719:

"Hemp may be easily raised in great quantities in this country, but we do not well understand the managery of it.

"I humbly submit it to your Lordship's consideration whether, if a few families, that understood it were plac't by His Majestie, on some propper lands in the Province of New Yorke (of which there are great quantities), and oblig'd to attend solely the raising of hemp, it would not be the best direction; and of use."

Four years later a memorial was presented to the lords of trade by 20 "merchants and others trading to His Majesty's Plantations in America," reciting the ignorance of the planters and predicting a falling off of production unless some encouragement be given. It bears the date May 24, 1723

"That the inhabitants of his Majestie's Plantations of New England, New York, the Jerseys, etc, are very little if at all acquainted with the proper methods of Sowing or Curing Hemp, or of preparing Trees for Making Tarr-Fitt for Cordage."

A special method for preparing tar apparently had been proposed, for the memorial continues: "For Making Tarr, none can be Expected From the Plantations if the Inhabitants be not Forthwith Instructed in this new method. Nor will any hemp be raised them, tho' the Duty upon it is now taken off and that there are many thousand Acres Fitt For the Produce of that Commodity the Inhabitants being Ignorant of the Method of Sowing and Cuting it."

Finally a farm demonstrator is proposed as the best means of promoting this branch of agriculture: "That they . . . humbly propose some person well Skilled in Raising and Manufacturing the several Species of Naval Stores (flax, hemp, tar), . . . may be Forthwith appointed with sufficient power to instruct the Inhabitants and conduct this Affair, which is of the greatest consequence to his Maj'ts. Dominions both here and in the Plantations."

Unfortunately no record has been found as to whether or not this proposal was followed out.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

In order to give wider publicity to the efforts of prominent agriculturists participating in the recent agricultural programs and conferences, the National Fertilizer Association has prepared a bulletin giving in details the salient features of all the addresses.

These conferences were held at Amherst, Mass., June 18; State College, Pa., June 22; Ames, Iowa, June 25; and Wooster, Ohio, June 29 respectively. The bulletin sets forth their purpose as a means of bringing about a better understanding between the agricultural college, experiment station and extension workers and the sales forces of the fertilizer industry. The talks by the outstanding authorities in all fields as they were given at the meetings are published in the pamphlet.

This bulletin is of particular value to the farmers in the respective sections because of the presentation of new angles on many of their soil fertility problems by men who have made a special study of the conditions in these territories. The talks themselves are very valuable to all agriculturists and presented as they are in such a handy form, they are bound to prove of great interest for study and future reference of the county agents and vocational teachers of agriculture concerned.

Other bulletins dealing with soil fertility received during the month include:

"Commercial Fertilizers," State Fertilizer Inspection Service, University of Maryland, College Park, Maryland, No. 118, August, 1926.

"Analyses of Commercial Fertilizers," Agricultural Experiment Station, Clemson College, South Carolina, Bulletin 229, August, 1926. R. N. Brackett, Chief Chemist, H. M. Stackhouse, Secretary Board of Fertilizer Control.

"The Significance of Nitrogen in Soil Organic Matter Relationships." Agricultural Experiment Station, Pullman, Washington, Bulletin No. 206, July, 1926. F. J. Sievers, H. F. Holtz.

"Fertilizer Experiments with Alfalfa Conducted at the United States Yuma Field Station, Bard, California, 1919 to 1925," U. S. D. A., Washington, D. C., Department Bulletin No. 1418, July, 1926. H. L. Westover, Edward G. Noble.

Crops

Among a large number of excellent publications on crops which have come to the editor's desk this month are two which are especially attractive both from point of information and editorial make-up. Special Bulletin No. 157, "Celery Culture in Michigan," by J. B. Edmond, Michigan State College, is a rather complete treatise of this important feature of the truck industry on the muck soils of the Wolverine state. It deals with the growing of the crop all the way from a discussion of the soil types and their preparation, seeding, cultivation, diseases, down to storage of the harvest. This bulletin contains many helpful hints for anyone interested in the growing of America's great "Thanksgiving bouquet."

The other Bulletin 432, "Spring Cauliflower in New Jersey" by

Howard F. Huber, New Jersey Agricultural Experiment Station, New Brunswick, N. J., treats in a very similar manner the growing of this popular vegetable. With excellent illustrations the valuable experiments conducted in 1923 and 1924 by the vegetable department of this station is presented in a convincing manner and should prove a source of ready reference to growers interested in the crop.

"Cooperative Cotton Variety Tests," Agricultural Experiment Station, Fayetteville, Arkansas, Bulletin No. 210, July, 1926. Martin Nelson, J. O. Ware.

"Rates of Planting Soybeans," Agricultural Experiment Station, Fayetteville, Arkansas, Bulletin No. 211, July, 1926. Martin Nelson, C. K. McClelland.

"Varieties of Cowpeas for Seed and Hay Production," Agricultural Experiment Station, Fayetteville, Arkansas, Bulletin No. 212, July, 1926. Martin Nelson, C. K. McClelland.

"The Dehydration of Prunes," Agricultural Experiment Station, Berkeley, California, Bulletin 404, August, 1926. A. W. Christie.

"Useful Knowledge for Florida Farmers," Florida Quarterly Bulletin of the Department of Agriculture, July, 1926. Nathan Mayo, Commissioner of Agriculture, Tallahassee, Florida.

"The Extent to Which Weeds Modify the Transpiration of Cereals," Agricultural Experiment Station, Ames, Iowa. Research Bulletin No. 96, June, 1926. A. L. L. Bakke, H. H. Plagge.

"Agricultural Conditions, General Crops and Livestock," Louisiana Agriculture Progress and Opportunities, Division of Extension, Louisiana State University and Agricultural and Mechanical College, Baton Rouge, Louisiana, Extension Circular 89, Part 1, July, 1926.

"Investigations with Strains of Beans," Agricultural Experiment Station, East Lansing, Michigan, Special Bulletin No. 156, June 1926. E. E. Down and H. M. Brown.

"Alfalfa Variety Tests," Agricultural Experiment Station, State College, New Mexico, Bulletin No. 152, March, 1926. J. G. Overpeck, W. T. Conway.

"Broomcorn," Agricultural Extension Service, State College, New Mexico, Extension Circular 91, May, 1926. George R. Quesenberry, Ralph R. Will.

"Sweet Clover Seed Studies," Agricultural Experiment Station, Fargo, North Dakota, Bulletin 197, May, 1926. O. A. Stevens, H. D. Long.

"Winter Wheat in North Dakota," Agricultural Experiment Station, Fargo, North Dakota, Circular 33. T. E. Stoa.

"The Sow Thistle," Agricultural Experiment Station, Fargo, North Dakota, Circular 32, July, 1926. O. A. Stevens.

"Physical and Chemical Characteristics of Maturing Apples as Related to Time of Harvest," Agricultural Experiment Station, Pullman, Washington. J. R. Neller, F. L. Overley.

"Apple Physiology, Growth, Composition, and Fruiting Responses in Apple Trees," Agricultural Experiment Station, Madison, Wisconsin. Research Bulletin 68, May, 1926. R. H. Roberts.

Economics

Delaware sends us the only bulletin received on economics this month. "Farming for Profit in the Middletown Area," Ext. Bul. No. 12, March, 1926, by R. O. Bausman is the name of it and it was published at the University of Delaware, Newark. A preface gives the objects of the bulletin: 1. To show the systems of farm organization and management which paid best in the Middletown Area. 2. To show the economic trends which influenced the farm business in this area since 1914. 3. To indicate the type of farming best suited to meet the present market demands. A careful reading of the bulletin will convince the reader that the objects have been well fulfilled.

Insects

Wisconsin is on the lookout. "Look for the European Corn Borer," by S. B. Fracker, State Department of Agriculture, and C. L. Fluke, College of Agriculture, warns Badger farmers against the invasion of this dreaded pest and urges them to send any suspicious looking insects boring in corn and other thick-stemmed plants to the Department or College for identification. There is also a history and description of the corn borer and other information for growers and agriculturists in susceptible territories, together with a map showing the districts now under quarantine to prevent the spread of the insect. The bulletin carries two numbers —Bulletin 75, State Dept., and Bulletin 385, Agr. Exp. Sta., and can be obtained by writing to either source.

"The Mexican Cotton Boll Weevil,"

Agricultural Experiment Station, Gainesville, Florida, Bulletin 180, May, 1926. Wilmon Newell, E. F. Grossman, A. F. Camp.

"The Cotton Leaf Worm, or 'Army Worm,' or 'Caterpillar' and its Control," Louisiana State University and Agricultural and Mechanical College, Baton Rouge, Louisiana, Extension Circular No. 91, August, 1926. W. E. Hinds.

"A Study of Microbiological Activities in Some Louisiana Soils, A Preliminary Survey," Agricultural Experiment Stations, Baton Rouge, Louisiana, Louisiana Bulletin No. 194, June, 1926. E. V. Abbott.

"Relation of the Honeybee to Fruit Pollination in New Jersey, A Preliminary Report," New Jersey Agricultural Experiment Stations, New Brunswick, New Jersey, Bulletin 434, June, 1926. Ray Hutson.

Diseases

"A Phytophthora Disease of Tobacco," Agricultural Experiment Station, Gainesville, Florida, Bulletin 179, May, 1926. W. B. Tisdale, J. G. Kelley.

"Concentration of Materials and Rates of Application in the Control of Apple Scab," Agricultural Experiment Station, East Lansing, Michigan, Technical Bulletin No. 76, June, 1926. W. C. Dutton.

"The Brown Root Rot of Tobacco and Other Plants," U. S. D. A., Washington, D. C., Department Bulletin No. 1410, July 1926. James Johnson.

* * *

Around the Year With an Apple King

(*From page* 16)

that it sent the solution out in big drops, but that was the best they had in those days.

The second spray is applied just after the flower petals drop. This is the most important spraying. The lime sulphur has to be reduced to the one to forty ratio for this application, as a stronger solution would injure the leaves. The third spray is applied two weeks later. It takes him about a week to get over the orchard in good weather. He finds very little difference in the blossoming time of varieties so the pump has to be kept going as long as daylight holds out during these few weeks in the year.

Webster believes in preparedness. He says you never know when you have to spray in these days of increasing troubles with plant diseases, so, for many years he has had some copper sulphate on the place ready for instant use. He has been fortunate, however, in keeping his orchard free from the apple maggot or railroad worm, so, up until now, the midsummer spray has been unnecessary.

Webster isn't ready to make any statements as to the value of fertilizer for his particular orchards. He says the bluffs were in virgin forests until the trees were cut down for orchard purposes. He believes that the apple trees require about the same kind of fertilizer that the forest trees before them needed. He says the thing to do is to conserve the fertilizer that is in the soil and to build it up if need be. He has studied many fertilizer reports from various sources but does not find any substantial agreement in them, so he prefers to lie low until more definite results are obtained. The last few years he has used some nitrate of soda, but he isn't sure as to whether it pays or not as the nitrate makes for a denser foliage and lessens the finish somewhat.

WEBSTER cultivates the young orchards with an extension disk cultivator to give the trees a good start, but after they are several years old he discontinues this practice as the orchard is so hilly

that it is difficult to keep the soil from eroding. He finds, too, that his trees have a tendency to blight when they grow too fast. The older parts of the orchard are no longer intercropped, so all he has to do in them from spraying time to harvest is to watch them and keep the grass and weeds cut down.

Webster and a Haralson apple tree developed at the University of Minnesota

Some years ago strawberry picking was a major early summer job, but this part of the business has been discontinued in later years. Raspberry picking lasts through the greater part of July. Great quantities of this fruit are grown and shipped to country stores in the Dakotas or to city markets. He grows the Latham variety in the main. The stalks are trimmed at 3½ feet so they will put their energy into growing berries instead of wood.

After the raspberries are gone, plum picking begins. Webster doesn't enjoy growing plums, however, so he is grubbing up his plum trees a few at a time and planting apple trees in their place.

The Dutchess apples are ready to harvest about the middle of August but the main harvest does not begin until September. The bulk of his bearing trees are Wealthies and Greenings, but he has many Mackintosh, Jonathan, and Delicious already producing fruit and a considerable acreage of these very desirable varieties is growing up. It was once thought that these apples could not be successfully grown so far north, but he has proven to the show world of the nation that it can be done, as more than a thousand bushels a year have found a ready market.

Webster says that the best place to grow a first quality apple is as far north as you can go and still get the finish, for it is the finish and flavor of an apple that determine the winner in these days when all exhibitors show uniform and worm-free samples. He says the flavor goes with the finish and it is the ability to produce this happy combination that is the secret of his success.

Though many varieties are grown in small quantities just to have a few of the various kinds, he finds the Northwest Greening to be his best money-maker because it very seldom drops from the tree. As he says, "If it ever sets, you'll get it in the barrel. It's not like

the Wealthy in this respect because many of that variety fall to the ground before picking time." He is finding the Haralson apple, developed at the University of Minnesota, to be a likely candidate for a larger place in his next plantings.

It is one thing to grow several thousands of bushels of apples but quite another to market them so they make a profit to the grower. Mr. Webster says the marketing proposition is different each year. Sometimes he sells to commission firms, sometimes to buyers in cities, and sometimes to the smaller towns. Last summer his orchard was hit by hail, resulting in small imperfections on the majority of his apples. He knew this would ruin their market value for the fancy trade in Chicago, so he sent them to the smaller country towns and was able to dispose of them at a handsome figure. When he found the local raspberry market flooded, he shipped his berries out to the Dakotas and got nearly twice as much as he would have received for them in La Crosse. Thousands of people come right up to his storage house and get fruit directly from his farm.

Webster intends to pack in baskets from now on as he finds this a popular pack. When he sells to a wholesaler who demands a pretty pack he faces them, but he prefers to sell a straight pack, with the same kind of apples on the bottom as on top. He says, "A basket that is faced with the nicest side out sells more quickly than one packed in the ordinary way, but I don't like it. It's harder to sell the first basket when you don't have the pretty faces out, but it's easier to get re-orders when a customer finds the apples all alike all the way down, whether you sell in baskets or barrels."

In other words a quality product sold in an honest way has built up a lasting trade for D. C. Webster, and happy in his work he continues to study new and better methods of growing fruit. He markets all his apples in the fall, so he has the winter months in which to enjoy life as it comes his way, or as he goes out to meet it.

* * *

Massachusetts

(*From page 28*)

The control services of the station include the inspection of fertilizers and cattle feeds, the testing of purebred cows for advanced registry, the inspection of machinery and glassware used in testing dairy products, and the elimination of white diarrhea in poultry.

The Experiment Station very early instituted studies on the use of commercial fertilizers. At the very beginning, quite naturally, this was developed on the thought that the function of chemical plant foods was to return to the soil those plant foods removed by the crop. Shortly, however, this concept was changed in recognition of the fact that the main reason why farmers use fertilizers is to return a profit on investment.

The first fertilizer orchard in the United States was laid out at the college nearly 40 years ago. The orchard is still in existence, and giving good crops. Unfortunately it became necessary to fertilize the check plot, in order to give the trees vigor to withstand insect attacks. There are also other areas which have a known fertility history for a period of more than 30 years. Some of these fields are

still being conducted on an experimental basis.

Much of the field work of the station has been supplemented by careful chemical work in the laboratory. Among other things the station studied very carefully the causes of the depressing effect of sulfate of ammonia when used continuously in large quantities. It was finally found that the trouble was caused primarily by the loss of lime, which brought about a condition in which certain toxic salts of iron and aluminum were made soluble. The addition of lime brought about a gradual but permanent improvement.

At the present time, in addition to the old work of the Experiment Station, comprehensive studies are being made in relation to cropping systems for tobacco. There is also a recently laid-out field given up to the study of plant food ratios and quantities of fertilizer application for onions, the onion being a large crop in the Connecticut Valley. This present spring, a study is being made of methods of applying fertilizer to corn, comparisons being instituted between broadcast versus localized application of several different mixtures.

A study of special interest to northeastern fertilizer men, which was started some five years ago, is that of the relation between fertilizer and the dominance of different plants in a permanent pasture. It was found that weed growth in the pasture, specifically of mosses and other low-lying plants, is due in the main to soil depletion, something which is easily remedied by the use of commercial fertilizers.

* * *

Effects of Limestone

(*From page* 12)

power for neutralizing soil acidity, is more durable and not so readily lost from the soil.

It also becomes a question of considerable importance to determine the degree of fineness necessary to grind the limestone since the finer the limestone is ground the higher the price will be to the farmer. This question has been very carefully and thoroughly studied at several of the experiment stations with very conflicting recommendations. The results recorded above were obtained with limestone ground so that it would pass through a one-fourth inch mesh sieve. It therefore contained particles one-fourth inch in size and all grades of material down to fine dust. Such material can be obtained more cheaply than that ground more finely and as the results reported above indicate, is very effective material for soil improvement.

Alfalfa grows luxuriantly on native limestone soils

Our Source of Food in 1950

By C. A. Le Clair

So much is said and written these days about urban style, slang and culture having movied, radioed and motored to the remotest corners of the United States, that one might be induced to believe that there was none of the wholesome farm folk citizenship still existent in America. Those who pen and chatter this kind of philosophy draw their conclusions from afar. They have not had the kind of contacts which are necessary in order to deduce the real facts.

It would be folly to discount the influence of the radio in making accessible the music of the white lights of Broadway to the inhabitants of a farm near Postville, Iowa. Similarly, the silver screen of even the remotest rural village has actually widened the world of our farm population generally. The auto has made the cinema and city shops more accessible so that it is a fact that when dressed in Sunday attire even an expert cannot differentiate between a youth from the city and his country cousin.

In other words, the so-called hayseed exists now only in novels. But note that I said the eye could not detect a difference between urban and rural folks. They are far different nevertheless. An hour's distance out of one of the largest cities of the country still brings one in contact with a different people. The rural school no longer red but brightened with a coat of white paint is still the common meeting place for farm social life.

Community Clubs, Equity Societies, and Farm Bureau units are the mediums which maintain and propagate rural community life. And it is at the periodic sessions of the organizations that one can come nearest to appreciating that rural culture of a fundamental type has survived despite the 20th century electrification of America.

VERY recently I was an invited guest at a typical evening farm bureau meeting. I left the city with its electrical flood of light drawing thousands of city folk to part with their money in order to be entertained by those who are being paid well for the purpose. Passing the limits of the city we passed several roadhouses from which echoed waves of modern jazz. Even in sight of these places of entertainment was the little school house for which we were headed.

It was evidently already inhabited for parked about it were almost countless numbers of cars.

Before we entered the building I expected that the attendance would be composed of old folks because surely young people must be dancing or "petting" on such a bright moonlight night. But this was not the case. The gathering was a "stag" affair to be sure but both budding manhood and mature farmers were there in numbers sufficient to pack the room.

It was however the motive that brought them there which most inspired me. They had met that night to learn the latest discoveries in agriculture. For two hours they drank in the words of the expert who addressed them. When the meeting was opened for discussion, the questions asked were well worded and intelligent. If this meeting were an isolated case it would be worthy of interest but it was just one of periodic meetings of this local and there are hundreds more like it. Here were people that loved the farm, evidently were making a comfortable living in the country, and were endeavoring to educate themselves to even greater proficiency in their permanent life work.

SOME really brilliant men are conscientiously alarmed about the admitted decrease in the rural population of the United States as contrasted to the rapidly increasing number of people in our cities. They have charged the cause of this condition correctly to the lure of better incomes offered by manufacturing establishments as compared with what the agriculture of the 20th century offers. Something must be done, they say, to keep youth on the farm. In reality if the underlying cause of the situation were really understood discussion of the matter would cease as in fact people of America are just simply instinctively reacting to basically fundamental economic laws.

The business of the people of any newly developed and growing country has from the earliest history of the world gone through phases parallel with those now being experienced by business in the United States. Naturally in colonial days there had to be a majority of the populace making its living directly from the soil. Time was, as industry became established, when the balance was about fifty-fifty with regard to our rural and urban population. Today the pendulum has swung still farther and it will keep on going in the same direction until agricultural production falls consistently short of the nation's requirements and export demands. When this time occurs, and it surely will, farm products will advance in price. Farmers and farm labor will be better paid and the lure of the country will draw its quota from the cities.

It is fortunately the most inefficient farmers and their sons who have been and are abandoning the farm. Since the inefficient in the majority of cases were raised or found themselves on the most unproductive marginal types of land, it is not surprising to see such lands actually upon abandonment revert back to their natural state. Their expensive contribution to production gradually being eliminated has made more secure the returns of the remaining efficient farmers operating adapted lands to the crops grown.

AT present even our very best farmers working the most favorably located and productive soils

are not yet producing as economically as possible. The science of agriculture in 1926 is several decades ahead of the average practice. For example only a fraction of a per cent of our farmers are growing the most improved varieties, employing commercial plant foods to supplement the native fertility of their soil, insuring the health of their crops by use of sprays to prevent disease and insect ravishes.

Records show that since 1870 the production per unit of man labor on our farms has approximately doubled. This however on the whole has been due to the employment of modern machinery. Other factors contributed less than 25 per cent to this achievement. With conditions of demand and correspondent returns applicable it has been estimated that the per capita farmer production in the United States can be increased, not with ease but with effort, as much as 50 per cent above the present average.

MANY varied estimates have been made as to what the population of the United States will be a quarter of a century hence. These calculations figure on a 150 million people by 1950, and an eventual population ranging between 200-500 million depending upon whether proper adaptations of standard living become effective.

Conservative estimates of what intensive, efficient farming could accomplish through more general application of the now known practical scientific methods reveal that the arable lands of the United States are capable of supporting comfortably a population of 300,000,000 people. That there are enough wide awake farmers who are making a study of their business and will be equal to the task of further per capita production as fast as demand justifies it is absolutely a fact.

The rapidly increasing enrollment of farmers in crop and livestock associations mothered by state agricultural departments represents the advance army of rural progressives. These farmers are sure to be in the minority. Likely they or their kind will always be in that position. This is because their successes are the goal of others and as their neighbors, the average farmers, through imitation equal their production, they the super-progressive move up by further improvement in their farm practice.

No class of individuals receive so much advice as farmers. Much of this they do not use or need. Our farmers now are the wealthiest per capita of any of their class the world over and this is largely due to the fact that their per capita production exceeds that of all other nations.

Time will prove that with their own brains and energy our rural population will continue to increase its standard of living and provide city folks with their desired and expected increased needs. We have an unspoiled, wholesome farm population in the United States today which reflects a wholesome permanence and not one single sign of decadence.

* * *

The bride and groom were visiting in Daytona Beach. They stopped at a restaurant to eat. A flip young waitress waited on them.

"Would you care for some honeymoon salad?' she asked.

"What is it?" asked the confused groom.

"Just lettuce alone," replied the waitress.—*Exchange.*

The Black Walnut— *A* Bad Neighbor

By F. D. Fromme

Plant Pathologist, Virginia Agricultural Experiment Station

THE black walnut tree is a poor neighbor for certain other trees and for some of the vegetables and forage crops. When its roots grow into contact with those of apple, tomato, potato, or alfalfa the invaded plant becomes sickly and is apt to die. No doubt many other plants should be included in a complete list of the walnut's victims but exact evidence in regard to them is lacking. It is known that the hay and pasture grasses, corn, beans and garden beets are not injured.

The effect on tomatoes growing near walnut trees is especially striking. It is shown by the sudden wilting of one or more of the branches of the tomato and there is no recovery as when the wilt is caused by drought. Examination of the roots in such cases shows contact between the roots of the walnut and those of the tomato that support the wilted branches. Further growth of the walnut roots causes wilting of other branches and results in the death of the plant. The soil area invaded by the walnut roots is clearly marked by the contrast between tomato plants within and beyond its borders; the limits of spread of the roots is easily traced. The injury to potatoes is less severe as a rule, the plants are stunted and the yield is poor but they do not always die.

Alfalfa plants are readily destroyed through contact with walnut roots and the areas which they have occupied are invaded with grasses or other plants not subject to injury. The outer limits of the walnut roots can be traced exactly by the border of living alfalfa and the interior zone of grass that has replaced it. That the root system of the walnut is very extensive is well shown in such cases. The limit of spread of the roots may be three times that of the branches. In one instance that is recorded the greatest spread of branches was 22 feet from the trunk while the greatest spread of roots, as shown by the death of alfalfa plants and the finding of roots at that point, was 64 feet from the trunk. The area of alfalfa destroyed by the walnut tree in this case was more than 1,800 square feet.

THERE are any number of things that may cause the death of an apple tree but if a walnut tree stands nearby it is not necessary to exhaust the possibilities or call a diagnostician. It is a safe bet that the walnut is responsible. The most expensive walnut tree known to the writer cost its owner four fine apple trees of bearing age. In the planting of the

orchard a flourishing young walnut was spared. It stood in exact alignment with the tree rows equidistant from four apple trees and everything was lovely for a while. But the root systems began to intermingle as the trees reached bearing age and apple limbs on the sides facing the walnut began to die. Eventually all four apple trees were destroyed. The damage was complete before the owner suspected the cause but he made up lost time in a hurry. He arose in his wrath and smote the offender with an axe.

It is assumed that the death of plants in these walnut associations results from the excretion of a toxic substance by walnut roots. Juglone, an organic chemical that is classed as a quinone, is suspected but exact proof of its role in the case has not been supplied. It is apparent, at any rate, that it does not pay to mix walnuts and apples except in fruit salads. The proper place for walnut trees is in the wood-lot, not the orchard or garden or field.

* * *

Potash or Manure

(*From page* 8)

80 acres in corn, waist high, a rich lustrous green, flanked on the north and east by the timber growing along the banks of the Wapsie. All this had been treated with potash.

The Professor pulled out his soil map of Black Hawk county. "So you say that this is Carrington loam?" inquired Northey.

"Yes, Carrington loam, some spots of peat, underlaid in places with clay."

"It may be Carrington loam, as far as I know, but it is underlaid with gravel and in some places quicksand, and if you do not believe it get a spade and I'll prove it to you—$100 is yours if I'm mistaken."

The Professor didn't care to open hostilities with Northey so they let the matter stand in Northey's favor.

"I'd like to show you the results on some more of the farms," said Northey, "but it's getting late. I've been pretty hard on you, so perhaps we'd better strike out for Waterloo.

"Professor, maybe you do not agree with me, but I have told my neighbor farmers that on soil of this kind they ought to use potash. It would pay them big returns. I've told them that the best way to find out whether they needed potash was to try it out in their fields. I think that this is a better way than a complete chemical analysis of the soil that you might make. This test is sure and easy to make. Potash cost me last year $55 per ton and if it will return a profit on this investment it ought to be used.

A rank growth of timothy. Potash was applied here

Where it has been used once its benefits, I find, are evident for many years. Perhaps an application every four years would pay.

"I have never tried it out in that way because I have always bought other land—many times run-down farms that were more in need of it than the older farms. We are running eight farms now and all of them get potash wherever we think they need it.

"I've had lots of fun with you today, Professor, and I hope I have not hurt your feelings."

"I've enjoyed it very much, Mr. Northey, and I've learned something besides. We appreciate studying the results of men who do things."

* * *

Anthracnose and Clover Failure

By T. K. Wolfe

Professor of Agronomy, Virginia Polytechnic Institute

IT is becoming increasingly difficult to secure crops of red clover. The causes of failure have been attributed to winterkilling, shading by the nurse crop, destruction by the hot sun after the nurse crop is removed, and to summer droughts but seldom to the use of the wrong kind of seed.

Recent experiments conducted by the Virginia Station with red clover from different sources show that one of the chief causes of the failure to secure stands of red clover is the use of seed susceptible to the disease known as anthracnose. The southern farmer is frequently advised to use the so-called hardy clover seed produced in the northern states on the assumption that seed grown under the severe climatic conditions existing there will be cold resistant and for this reason will be suitable for his conditions. The problem in the southern states is not one of winterkilling but one of disease resistance and especially resistance to anthracnose. Some of these so-called hardy northern seeds do not give good results in the anthracnose infected area of the South. Likewise, the foreign grown red clover is more susceptible to anthracnose than adapted United States grown kinds.

The present indications are that spring seeded red clover is much more affected with anthracnose than late summer seeded clover. This condition is due to the fact that anthracnose does not develop until the middle of the summer. Thus, when anthracnose susceptible red clover is seeded in the spring in the southern states, heavy losses usually ensue, and they are attributed to such causes as drouth and removal of the nurse crop. However, the late summer seedings usually allow a good first

cutting of clover to be produced but the second growth is very small, when seed susceptible to anthracnose is used.

Whenever possible red clover seed resistant to anthracnose should be used. The Virginia tests show that seed produced in Virginia, Tennessee, Ohio, and Maryland is resistant to anthracnose. In fact the Tennessee Experiment Station has developed by selection, a strain of red clover that has proved to be very resistant to anthracnose as shown by trials over long periods of time. There are farmers in these states who have produced their own clover seed for a number of years. It is logical to suppose that the seed is very resistant to the disease.

The various tests so far conducted with red clover in the southern states, indicate that the farmers in this region, when purchasing red clover seed, should consider the disease resistance factor more than the factor of cold resistance. Disease resistant seed produced in the southern or adjacent states, such as Tennessee, Ohio, Maryland, and Virginia, has proved of more value than foreign grown or northern grown red clover seed.

Better Seed Potatoes

(*From page 26*)

roguing the main crop, for the production of certified seed.

From the State of Maine comes the authentic story of the Higgins Bros. who sold certified seed produced from one tuber to their neighbors in the spring of 1925 to the extent that 37 cars were marketed in the fall of last year. They had been working with the progeny of this one tuber for four growing seasons.

Some knowledge is required to detect the degeneration diseases, but most of all a farmer needs to recognize a healthy plant when he sees it, realizing that any deviation from the normal potato plant will eventually lead into trouble.

* * *

Fertilizers Speak Up

(*From page 22*)

increase of 8.36 bushels at a cost of 21.5 cent per bushel.

Nickels has secured a splendid lot of data for the future guidance of himself and the other farmers in his locality. Detrick has been his close counsellor in all this work.

Marden's Cod Liver Oil for Poultry—*a pure vitamin food*

MARDEN'S COD LIVER OIL FOR POULTRY

NEWFOUNDLAND Cod Liver Oil is the richest in the world. It prevents rickets in young chicks—makes laying hens produce better—puts weight on killers. Marden's is pure, fresh, and untainted, *rich, golden yellow* in color. Taste is very agreeable. Rendered at sea, by steam, from fresh livers when fish are caught. Everything sanitary. Tested twice and certified for Vitamins A and D. If your dealer cannot supply you with *Marden's* (remember that name) then order direct at following low prices: 1 gal. can $2.25; 5 gal. can $8.75; 10 gal. can $16.00; 30 gal. bbl. $40.50; 55 gal. bbl. $74.25.

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Country Beautifying

By V. V. Hostetler

Covina, California

REALIZING the importance of first impressions Southern California has begun an organized campaign to beautify the railroads and highways which might well be copied by other states.

Through San Bernardino, the Gate City, it is estimated that three-fourths of the tourists enter Southern California by rail and automobile. All railroads and boulevards from the city to Los Angeles are being beautified by the Valley Beautification association which comprises 22 cities and towns.

The Union Pacific Railroad and the interurban electric company with the same object in view are planting their roadbeds with wild flowers and converting their depot grounds into attractive parks.

The Valley Beautification association in anticipation of California's rainy season has already had several wild flower plantings and has sown hillsides, visible from the railroads, and main boulevards with many varieties of hardy wild flowers such as California poppies, scarlet and blue larkspur, baby blue eyes, and wild heliotrope. Seed for this sowing was selected by a seedman who specializes in western wild flowers.

This association is sponsoring a California Wild Flower Day as another means of preserving California flowers and encouraging their culture.

The association's aim is not only to beautify but also to rid the landscape of dump grounds and other unsightly objects.

A recent get-together of Indiana Club workers

A Bushel per Hill

(*From page* 13)

neighbor of his, the State Specialist in Plant Pathology who had been doing a great deal of work in the control of potato diseases and consequently much interested in the production of that crop, and the county agent. On the way to the Heck place many speculations were made as to what Mr. Heck would have to say should the party be unable to find any potatoes in the hill.

If there was anyone in the party who believed that Mr. Heck was taking them on a wild goose chase those fears were soon put to rest at the first sight of the hill. Even the most casual observer could readily see that it was an unusual hill. Long vines ran out several feet in all directions and while the foliage was practically all dried at the time of examination, one could easily imagine the great mass of green that must have been there when the plant was growing, covering an area of 12 to 15 feet in diameter. These vines were cleared away and the digging commenced, and with the first forkful of earth the tubers began to appear.

When all the potatoes had been taken from the hill they were carried to a pair of scales, weighed and counted with the result that there were 72 potatoes and they weighed 72 pounds. They ranged in size from a few ounces up to 3 pounds, smooth, sound and of good commercial table quality.

At first thought it would seem that many potatoes had been used for seed, but upon careful examination of the vines it was found that only one seed piece had been used. Asked as to the variety Mr. Heck was unable to give any name for them, stating that the seed had been some he had taken from the potatoes he was growing in his regular patch.

"That certainly is the biggest hill of potatoes ever produced," stated the Plant Pathologist, and this view was joined in by the other members of the party. None had ever seen potatoes turned out as they had come out of this hill. With the sackful carefully put away in the car the party headed back to town to exhibit the prize. The potatoes were photographed along with the vines and that photograph accompanies this article.

Everyone in the party was very curious to learn how Mr. Heck had raised such monstrous potatoes, and questions soon began to fly at him trying to bring out what he had done. Finally Mr. Heck simply said that he had followed out good farming practices in producing the hill. He had carefully selected some very good soil and especially prepared the seed bed, had used commercial and organic fertilizers rather heavily and had watered and cultivated thoroughly during the season. A nitrogen, phosphoric acid, and potash carrying fertilizer had been used. The soil which had been used had the previous year been heavily manured.

It would appear from the experience just given that a great many of the soils will respond to a very marked degree if given a chance to do so. Mr. Heck, while he does not advocate that every potato grower try to produce 72 pounds in each hill, does believe that most of the soils in his community can be brought to a higher state of productivity by the proper treatment such as cultivation and fertilization. Another thing which he points out as very important is the proper selection of a soil for the crop to be grown upon.

Jeff McDermid's

ALMOST every week my mail contains several letters from readers who suggest that my essays on various aspects of life should be published in book form.

One of those who remind me of this need, C. A. Wicklund, down in Independence, Kentucky, where they raise rare tobacco, blue grass and hosses that *are* hosses, says:

> Why not issue your choicest articles in compiled form, from time to time? By chance this morning (March 31, 1926), I picked up BETTER CROPS of July, 1924, and the subject that held my attention was "Time." It was to the point and carried a great deal of weight.
>
> A compilation of these articles or essays or stories or whatever you call them in book form would no doubt command a ready market . . . there must be others like myself. Your articles do not grow out of date like others on soils, but furnish food for thought and inspiration from time to time when we need to "let ourselves out" and get away from the grind for a spell.

Many thanks, friend Wicklund!

The truth is this: that a plan is already on foot which, if successful, has for its aim the collecting of the best of the Jeff stories between the covers of a book. But publishers are cautious folks: they want to know before they start printing how many dollars will come rolling in upon publication of the new volume.

So Jeff puts it up to you!

How many of you would part with a dollar or two for a 200-page book containing, neatly done in the most modern printer's art, my Cogitations-in-Print?

Raise your hands so I can count! Or better yet, send the coupon —I am getting a bit near-sighted, and I might miss an upraised hand or two here and there.

stories
—*in book form?*

And I'll tell you what I'll do—to the *first fifty* who mail the coupon I will mail *at once* two little volumes of my "CYNIC'S DICTIONARY," already in print by another publisher.

And to make Bargain Day complete, I promise that the new volume, which I may call

STUBBLEFIELD MUSINGS

will arrive in the hands of the *first hundred* who mail the coupon autographed with a new individual thought. (That is, if the book is finally published!)

The frontispiece will be a soft-focus view of the author himself. And in the book will be some new material which has never appeared in BETTER CROPS—stuff that will make you think, or smile as the case may be.

Read it; save it; or give it away

The new volume, as planned, will be bound **de looks,** and will make an excellent gift if you wish to cheer up some choice friend.

And anyhow, if you cannot read it or give it away, like "Caesar, dead and turn'd to clay," this book will at least "stop a hole to keep the wind away!"

As they say in the ads.:

SEND NO MONEY!
Mail the coupon—*NOW*

Jeff McDermid

BETTER CROPS
10 Bridge Street, New York

Dear Jeff:

You can count on me—I'll take a copy of your new STUBBLEFIELD MUSINGS at a dollar or two if you succeed in persuading a publisher into signing a contract to issue it.

Name.....

Address..... City.....

P.S.—Don't send it before Christmas—I'm usually short enough about that time without buying your book—next Spring some time will do.

Rules

(*From page 4*)

more pleasure than to hold that teacher's throat in my bare hands just long enough to feel a thrill of eternal satisfaction at his last gurgle!

Whew! I was glad it was over!

But there was a surprise in store for me. The next voice I heard was the teacher's. "Men," he said— the while I waited and wondered what was next, "we have with us tonight a gentleman who I understand is a past master in the art of holding audiences spellbound. I am going to ask him to say a few words to us, and I know he will give us a splendid example of what we all hope in time to attain through our studies here."

And he introduced *me!*

My companion, knowing my weakness for hearing my own voice and having heard me lecture on various subjects, had unbeknownst to me tipped the teacher off to call on me. I was in for it.

MY first thought while getting to my feet, was to abide by the rules, which obviously called for a few pretty words of congratulations to the teacher on his splendid work, a thought or two for the class, a hurrah and hokum about the orators of the past who held their audiences in the palm of their hands and moulded the public opinion of their times.

The rules called for politeness.

But I would have you know that I, too, am a rule-buster of no mean parts. I have never been able to discover who said "Rules were made to be broken"—but I have often suspicioned that I, myself, said it first—in my sleep.

So, as I walked to the dais I resolved to take that teacher's neck in my hands and throttle him mentally, which might yield, I should see, as much satisfaction as to physically choke him to death.

Purposely I stumbled up the steps—almost fell onto the rostrum—while the teacher half rose in an involuntary effort to assist me, and the class stopped breathing—aghast!!

"You see— I have broken the first public-speaking rule," I cried, while the audience looked at each other with smiles, as much as to say, "Well, he has poise, anyway— he got out of *that* cleverly."

"And, now, I am going to break some more." I looked earnestly at the teacher.

I launched abruptly into my opening. I explained that I had purposely stumbled—to get their attention. I pooh-poohed rules. I pointed out that the men in history we remember were the ones to whom rules meant only tape lines to guide the weak.

Without apology I corralled every evidence that came to my mind of the value of rule-busting. Then I began to lead into public speaking.

Without daring to look directly at the teacher, who seemed fidgety and non-plussed, I told that class in no uncertain tones some of the things that had been boiling up in me as I watched each of them, automaton-like, ascend to the platform and render their puny, weak, futile, and inane five minutes' work.

Citing relevant examples in the past as proof I told them frankly to forget *which* foot they stood on as they talked, to cease to remember that they had wrists, elbows or fingers. I delightedly unravelled, strand by strand, all the elegant weave of rules that the patient teacher had woven in previous sessions—while his jaw dropped at my audacity and his eyes stuck out so that you could

have knocked them off with a cane!

"Public speaking means speaking in public," I roared,—"and speaking means *thinking.* Never mind learning gestures. Get so full of your subject, so full of earnestness, so wrapt up in what you are doing that you will unconciously use your hands in the way you were intended to use them —*naturally!* And never, under any circumstances, make any talk in public unless you have something to say and want to say it so badly that you'd throttle the man who attempted to stop you!"

AS I increased my vehemence I received increased attention. The class knew something was going on all right—and I could see they already were beginning to see that I was right and their teacher wrong. Of course, I knew I was being a boor, taking undue license for a guest, and was due for an oral pummeling when I had finished.

But I had an opportunity to convert twenty-five earnest men to my theory of rule-breaking, and I seized it. I am always an opportunist, and an opportunist is simply "a guy what seen his chanst and took it."

I reserved for the last this: An actual demonstration of how three well-known public speakers break every known rule—Billy Sunday, Will Rogers and Dr. Frank Crane.

"The rule breakers are the men who count," I said. "I am going to imitate three speakers for you. Any one of the three makes more money in one night than ten public speaking teachers earn in a month! Why? Because they have individuality, personality and something to say that folks are willing to pay to hear! You men, through learning set rules, are draining off your own personality, getting stilted, cold, doll-like. Forget it! It's *what* you say that matters—not *how* you say it! Spend your time improving your *message* and your delivery will take care of itself. Here's what Billy Sunday thinks of your rules for public speaking"—and I gave as good an imitation of the Immortal Holy Terror as I could.

I lay no claims to being a mimic, but earnestness undoubtedly made up for any lack of skill in portraying my chosen three rule-busters. I at least clenched my fists and dropped to my knees in imitating Sunday; chewed gum and swung an imaginary lariat as I depicted how Will Rogers, at a thousand dollars a night, broke all the rules of public speaking classes, while I told them that Will, the Clown, never did know—and never will know—how to put the third and fourth fingers together and arch the little finger.

When I came to Dr. Frank Crane I sat in a chair and delivered my closing remarks from the sitting posture, showing how Crane, although grossly violating the rules, makes a homey hit with his hearers by sitting *with* them instead of standing and talking down to them.

AS a final take-off I cried: "Bust the rules wide open! You'll be successful. Have something to say! Say it in a different way! Stand on your head if you have to in order to get attention! But bust *some* rule—just for luck!"

And, thanking them, I sat down!

My little audience rose to applaud and cheer—broke out of their seats to come to me. The teacher—well, the rest is sad, and I am modest. So, that's the story, anyway.

RICH SOIL

Two farmers were arguing about the fertility of the soil of their respective states.

"Why, the soil is so rich in my state," said one, "that a man with a peg leg daren't stand still for five minutes. The wooden leg will grow roots."

"That's nothing," the other farmer responded. "Back where I came from the land is so rich that all the peg-legged men carry hatchets so they can chop off the twigs that keep sprouting on account of all the nutritious dust in the air."—*Farm Life.*

THE ACID TEST

Mrs. Greene: "Mary, how do you tell an old chicken from a young one?"

Mary: "By the teeth, ma'am."

Mrs. Greene: "How silly! Chickens have no teeth."

Mary: "No, but I have."—*Kansas City Star.*

A BAD BARGAIN

"Mother, come out and play ball with me," pleaded six-year-old Bobbie.

"I'm sorry, son, but I can't play ball."

"Yes, that's what a fellow gets for having a woman for his mother."—H. B., Vienna, Ill.

To keep down weeds in the garden, take a hammer and pound them in.—*Exchange.*

EVIDENTLY TO NO AVAIL

A small boy was taken by his father to Washington and taken to visit Congress.

He was much interested in the chaplain, who always opened the sessions with a prayer. Both in the Senate and the House he had observed this procedure.

Finally he asked: "Papa, why does the minister come in every day and pray for Congress?"

"You've got it all wrong son," replied his father. "The minister comes in every day, looks over Congress, and then prays for the country."—*Chicago Tribune.*

A MODERN STUDENT

Teacher—"I'm surprised at you, Sammy, that you cannot tell me when Columbus discovered America. What does the heading of the chapter say?"

Sammy—"Columbus, 1492."

Teacher—"Did you ever see that before?"

Sammy—"Yes, but I always thought it was his telephone number."

FAST WORK

A mother called her little daughter to her. "Just imagine, dear," she said, "Aunt Mary has a new baby, and now Mamma is the baby's aunt, Papa is the baby's uncle, and you are her little cousin."

"Well," said the astonished little girl, "wasn't that all arranged quick?"—*Heywood Advertiser.*

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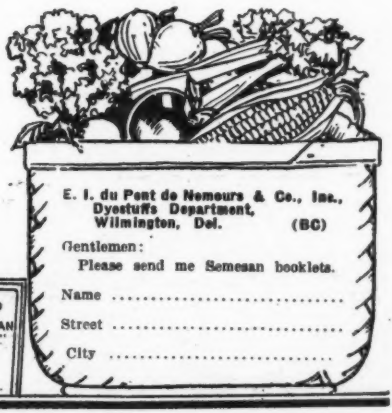

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The Michigan Experiment Station also reports (Special Bulletin 136) that on muck soil plots in Huron County a frost occurring on the night of August 20, 1922, practically killed the corn on unfertilized plots. They suggest as an explanation that "this protection probably is due largely to the greater growth of the crop on the fertilized plots which tended to prevent the loss of air near the ground. It may be due in part to a greater resistance to freezing offered by the plant juices of the fertilized crop."

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